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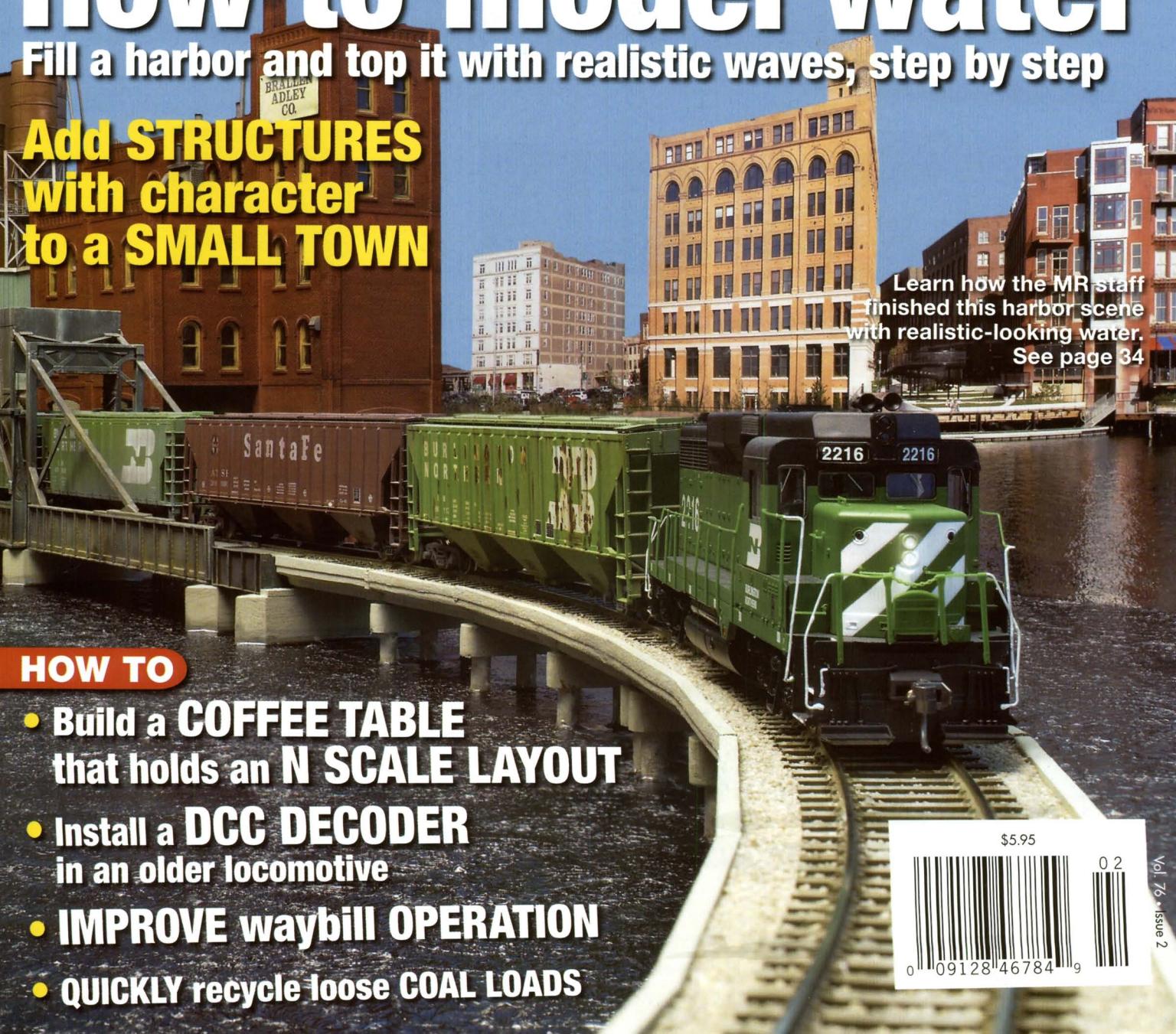
Model Railroader®

February 2009
www.ModelRailroader.com

How to model water

Fill a harbor and top it with realistic waves, step by step

Add **STRUCTURES**
with character
to a **SMALL TOWN**



Learn how the MR staff finished this harbor scene with realistic-looking water. See page 34

HOW TO

- Build a **COFFEE TABLE** that holds an **N SCALE LAYOUT**
- Install a **DCC DECODER** in an older locomotive
- **IMPROVE** waybill **OPERATION**
- **QUICKLY** recycle loose **COAL LOADS**

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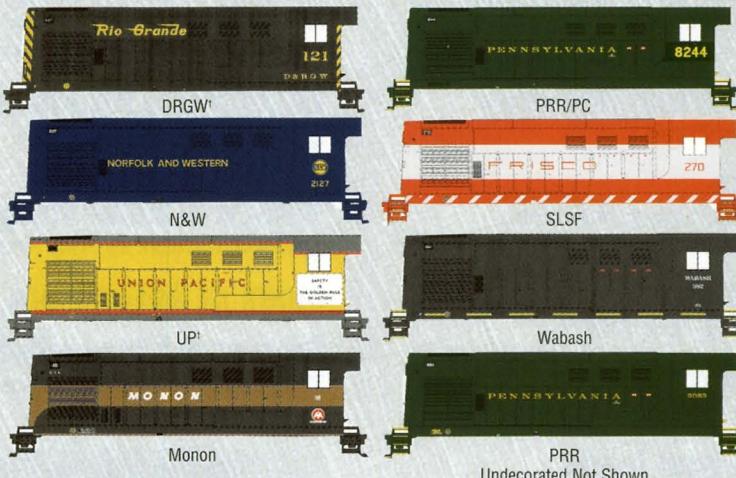
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In Service: 1944 - early 80s, several preserved examples.

Primary Assignment:

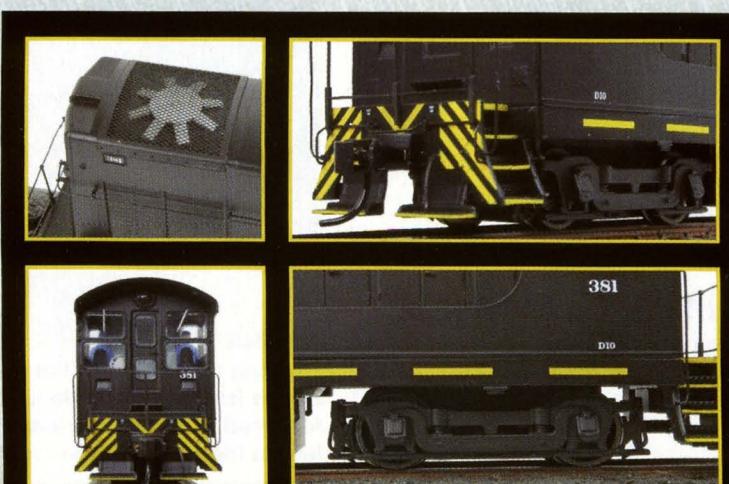
Yard switcher.

Unveiled in 1944, the H10-44 marked Fairbanks-Morse's entry into the diesel locomotive market. F-M found many buyers for the 1000-horsepower units among railroads eager to replace aging and costly steam switchers. Some 197 were built through May of 1950 when a 1200-horsepower version (H12-44) was introduced, which used the same body through 1952. Some soldiered on into the early 1980s, often working for shortline and industrial users. The first H10-44 was restored by the Illinois Railway Museum and is still in operation.



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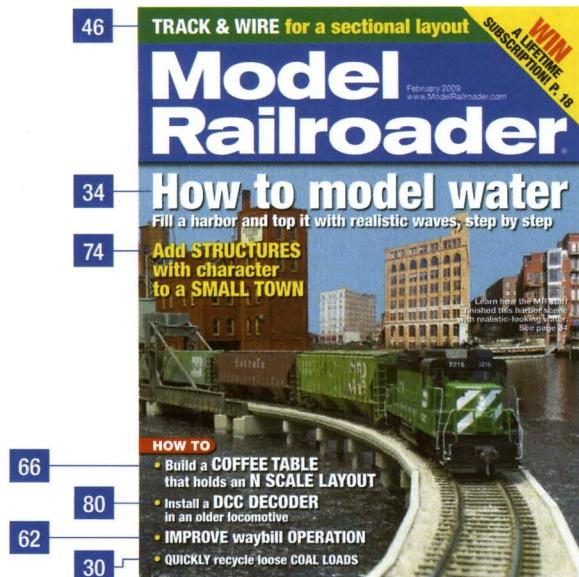


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Broadway Limited HO Pennsylvania RR I1sa 2-10-0

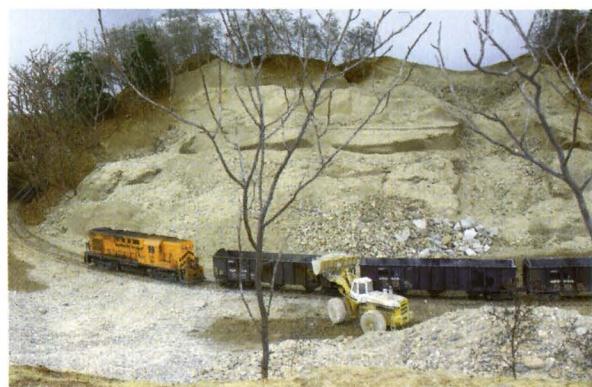
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Coming next issue: Mike Confalone's gravel pit scene (shown above) is just one of three projects featured in the March issue that can make your layout look bigger. Mike Confalone photo



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RAPIDO

Guest editorial: Virtual Rail-ality

David Popp, managing editor



Yes, the title is hokey, but it serves the idea well, so hear me out.

This is a concept that's been forming itself in my head for the last 10 years. It got its start one night while I was at my friend John Proebsting's house. John had a large HO scale Soo Line layout (featured in *Great Model Railroads 2002*), and a group of us, including DCC Corner columnist Mike Poslgrove, used to meet at John's once a week.

On this particular night, John was working on the engine terminal at Stevens Point, Wis., one of the towns that he modeled. For months he'd been wrestling with getting the scene around the coal tower correct. The problem was that despite the formidable stack of photos and reference materials John had collected, he still didn't have one for this location. In every photo it seemed that this part of the scene was always just out of the shot. In good fun, we teased John about trying to peel up the edges of his photographs to see what was around the corner.

Fast forward to present day. If you've not tried the Street View function on Google Maps, I highly recommend it. By simply clicking on a street from a Google satellite map and selecting Street View, you can see what your destination looks like at street level. Not only that, the program has a 360-degree view function, so you can see what is across the street or down the

block as well. While it's a helpful way to find where you're going, the technology behind it has great potential, which brings me to the concept of Virtual Rail-ality.

Suppose someone were to create a database of railroad photographs and maps (collected from any number of people and institutions) for a given location. Let's use Stevens Point as an example. Then, suppose that the person sorted those photos by specific eras and used computer software to stitch together the images and maps to create a set of "virtual worlds" for Stevens Point. Finally, suppose that data was offered to users in a Google-Maps-Street-View sort of way, complete with the 360-degree viewing option. Type in Stevens Point, 1952, choose the location on the map, and presto! You've got the view of John's coal tower and everything around it.

As corny as the name Virtual Rail-ality is, I think you'll agree that the program would be an amazing research tool.

So, for those of you who are tech-savvy, get started on this thing soon. I, for one, would like to use it because I'd love to know what the rest of a lot of the places I model looked like.



Contributing to *Model Railroader*

We welcome contributions from our readers, including articles, photographs, and prototype drawings. For detailed information on submitting material to MR, contact our editorial associate Eric Stelpflug at 262-796-8776, ext. 583, or mrrmag@mrrmag.com. *Model Railroader* assumes no responsibility for the safe return of unsolicited material. We assume unsolicited material is intended for publication by Kalmbach Publishing Co. unless otherwise noted. We assume letters, questions, news releases, and club news items are contributed gratis.

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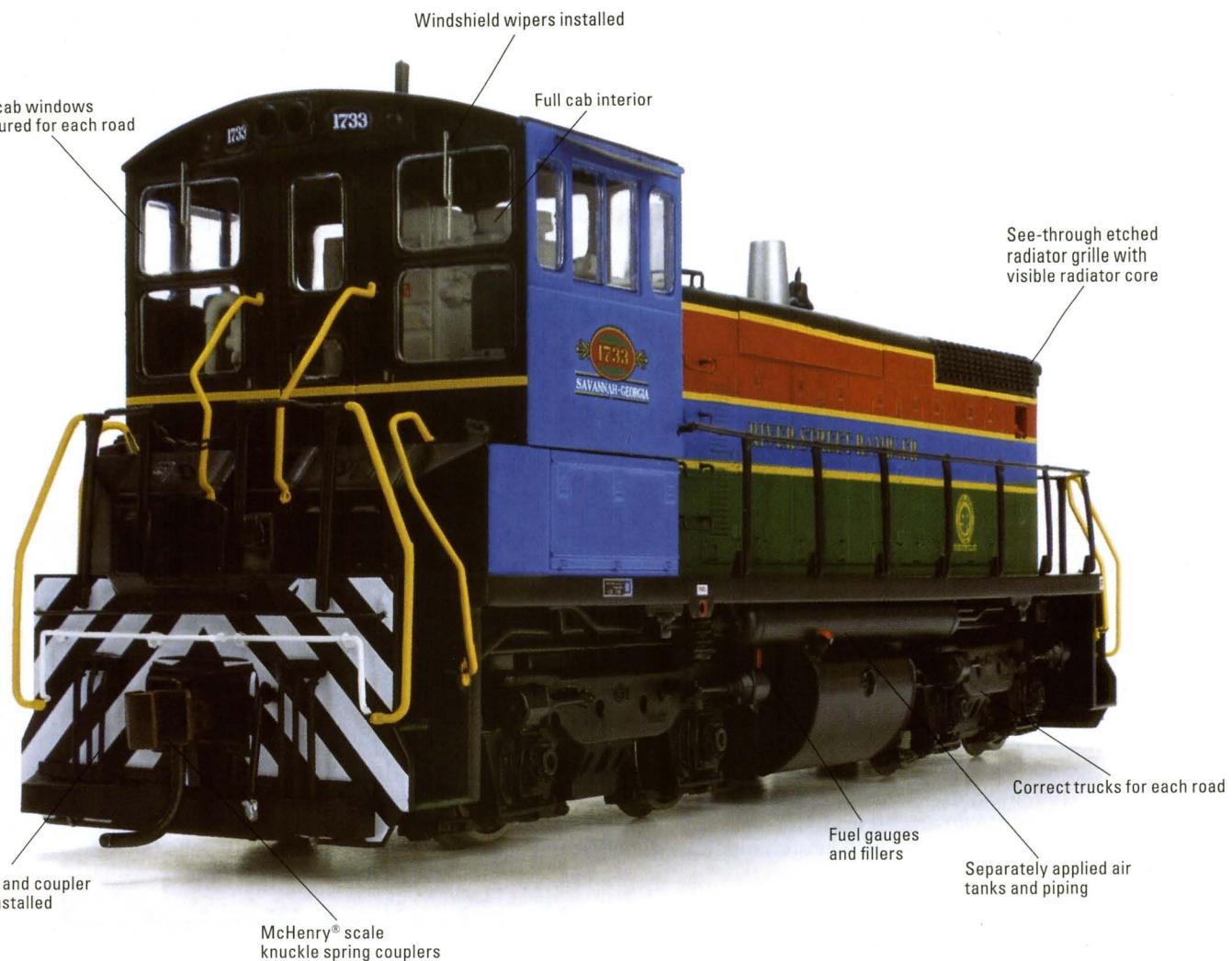
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95845	CSX YN2 #1115	\$89.98	95850	Rock Island #943	\$89.98	95854*	Western Pacific #1503
						95840	Undecorated

News & Products



On 2½ modern 4-4-0 American steam locomotive.

In hobby stores now is this O scale narrow gauge steam engine from Bachmann Trains. The model is designed with interchangeable details to

represent a variety of prototypes. The locomotive is equipped with a dual-mode Digital Command Control decoder and is available decorated in six unlettered paint schemes. It sells for \$330.

New products on display at Trainfest

For the third year in a row, Milwaukee's Trainfest has set a new attendance record. The show, held at the Wisconsin Exposition Center at State Fair Park in the Milwaukee suburb of West Allis, Wis., attracted 21,621 railroad fans on Nov. 7-9, 2008. Trainfest featured 70 model railroad manufacturers, 54 working train layouts,

more than 50 hobby retailers, and numerous other vendors, exhibitors, and attractions.

Many attendees came to the show to see the latest products being released by model train manufacturers. Freight cars were the most prevalent items premiered at the show, with new models in HO, N, and large scales.

Hoppers were popular, with new HO scale covered hoppers unveiled by InterMountain Railway Co. and Tangent Scale Models, and a two-bay coal hopper in 1:29 proportion from Aristo-Craft.

A number of new Digital Command Control products were also on display. Digitrax exhibited a new drop-in decoder for N scale InterMountain FP7s, while Train Control Systems had prototypes of several new N and Z scale decoders on display. Bachmann showed prototypes of several expansion items for its Dynamis infrared wireless DCC system.

A few manufacturers had pre-production models of upcoming

items on display, including HO scale Southern Pacific *Daylight* passenger cars from Broadway Limited Imports. MTH Electric Trains showed off the body shell for its HO scale Electro-Motive Division SD70ACe locomotive.

You'll find more products shown at Trainfest on pages 10 and 11.

► Highlighted in this issue

10 Bowser HO scale GE U25B and Alco C-628 diesels

11 1:29-proportion offset-side coal hopper by Aristo-Craft

11 Digitrax DCC decoder for InterMountain N scale FP7

12 Atlas HO scale C&NW covered hopper three-pack

16 List of manufacturers in News & Products

Looking for MR anniversary cars?

Locomotives and cars decorated to mark *Model Railroader* magazine's 75th anniversary have been announced by Athearn Trains, Micro-Trains Line Co., and Rapido Trains. They can be ordered from local hobby shops, not through MR itself. For more information, see the manufacturers' Web sites: athearn.com, micro-trains.com, and rapidotrains.com.

NMRA challenge to patent found valid

The United States Patent and Trademark Office has found in favor of the National Model Railroad Association in its effort to overturn Real Rail Effects' patent on using sound with Digital Command Control, the NMRA announced in a press release.

The NMRA said that the patent office is in the process of striking Real Rail Effect's patent.

The firm was originally granted its patent based on a claim that it had invented the technology to use sound with DCC. The NMRA, with the technical and financial support of a number of DCC manufacturers and hobbyists, challenged the patent on the basis that the technology existed before the patent was granted.

Real Rail Effects now has two months in which to file a response to the patent office's decision.

► Calendar

Feb. 14-15: World's Greatest Hobby On Tour. Nashville Convention Center, Nashville, Tenn. wghshow.com

Feb. 21-22: World's Greatest Hobby On Tour. Henry B. Gonzalez Convention Center, San Antonio, Texas. wghshow.com

Feb. 25-28: 2009 Sn3 Symposium. La Quinta Inn Clearwater Central, Clearwater, Fla. www.sn3.org/2009/

March 14-15: World's Greatest Hobby On Tour. IX Center, Cleveland, Ohio. wghshow.com

June 18-20: 2009 O Scale National Convention. Student Union Building, Towson University, Baltimore, Md. www.oscaleeast.com

July 5-11: 2009 NMRA National Convention and National Train Show. Connecticut Convention Center, Hartford, Ct. www.hn2009.org

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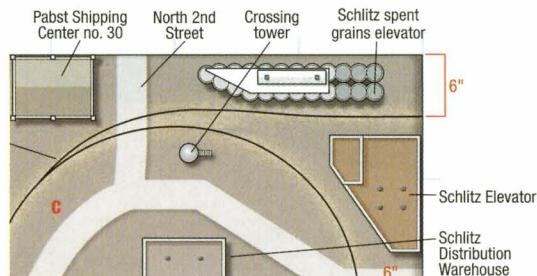


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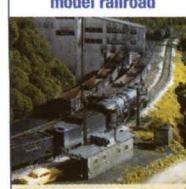
Featured article collections

Learn how to build and operate the HO scale Coal Fork extension

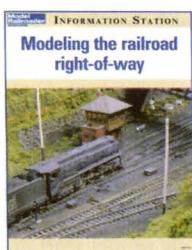


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Trainfest
show
special!



HO scale GE U25B and Alco C-628 diesel locomotives. Bowser displayed production samples of its newest ready-to-run HO scale locomotives at Trainfest 2008 in Milwaukee. Pictured at left is the General Electric U25B, painted for the Chicago, Burlington & Quincy; at right is an Alco C-628 wearing Delaware & Hudson livery. The Executive Line models feature brass detail parts, steel wire grab irons, and Bühler can motors with flywheels. They will be available this summer as direct-current models for \$169.95, or with SoundTraxx Tsunami Digital Command Control and sound for \$279.95.



HO scale Mikado steam locomotive. This United States Railroad Administration light 2-8-2 freight engine is the latest locomotive from MTH Electric Trains. In addition to the Baltimore & Ohio model shown, the Mikado is also available decorated for the New York Central, Pennsylvania RR, and Union Pacific. The ready-to-run model comes with a smoke unit, built-in sound, and a decoder for Digital Command Control and MTH's Digital Command System for \$449.95.



N scale Milwaukee Road rib-side boxcars. Fox Valley Models exhibited its new models of the Milwaukee Road's distinctive 40-foot steel ribbed-side boxcars at Trainfest. The cars will be offered in three body styles and several paint schemes. The ready-to-run cars will feature etched-metal details, Micro-Trains trucks, and magnetic knuckle couplers. Prices are yet to be announced.

HO scale locomotives

Electro-Motive Division SD60 diesel locomotive. Electro-Motive Division Leasing (ex-Burlington Northern), Norfolk Southern, Oakway, and Union Pacific. Three road numbers each. Eight-pin Digital Command Control wiring harness, prototype-specific details, and McHenry magnetic knuckle couplers. \$109.98. April 2009. Ready-to-Roll. Athearn Trains

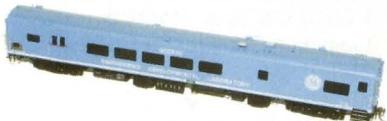
HO scale freight cars

40-foot combination-door steel boxcar. Burlington Northern; Canadian Pacific; Chicago, Burlington & Quincy; Great Northern (red, Big Sky Blue, or *Empire Builder* scheme); Milwaukee Road; Northern Pacific (red or green); Pacific Great Eastern; Soo Line; and Union Pacific. Also available with data only (red, mineral red, or oxide red) or undecorated. Accumate magnetic knuckle couplers. \$12.98. Accurail



Atlantic Coast Line 50-foot cushion-underframe boxcar.

Working cushion underframes, magnetic knuckle couplers, and 100-ton roller-bearing trucks. \$34.95. Ready-to-run. Kadee Quality Products Co.



General Electric test car no. 90.

Light blue or gray with red stripes. Working directional marker lights, eight-pin Digital Command Control plug, and scale magnetic knuckle couplers. \$618. Ready-to-run. Overland Models Inc.

R-70-15 57-foot mechanical refrigerator cars. American Refrigerator Transit/Missouri Pacific, Bangor & Aroostook, Pacific Fruit Express/Southern Pacific, PFE/Union Pacific, and Western Fruit Express/Great Northern. Twelve road numbers each. PFE cars \$42.95; others \$43.95, Ready-to-run. Red Caboose



HO scale fire pumbers. You can protect your HO scale structures from fire with these transition-era fire trucks from Sylvan Scale Models. The vehicles have American-LaFrance pumper bodies and are



available with an open or closed 1947-'54 American-LaFrance cab (pictured at left) or an open or closed 1950-'53 GMC cab (pictured at right). The unpainted resin vehicle kits sell for \$29.95.



Pullman-Standard PS-2CD 4,740-cubic-foot capacity covered hopper. Denver & Rio Grande Western, Burlington Northern, Burlington Northern Santa Fe, CSX, Erie Lackawanna, General Electric Rail Services Corp. (TLCX), Missouri Pacific, Norfolk & Western, Pillsbury (TLCX reporting marks), Union Pacific, Western Pacific, and W.W. Hill Grain Co. Wire and etched-metal details, roadname-specific details, and Kadee scale magnetic knuckle couplers. Ready-to-run: Single cars \$42.95, mix-and-match six-packs \$236.99, 12-packs \$469.99, undecorated kits \$24.95 each. Tangent Scale Models

HO scale structures



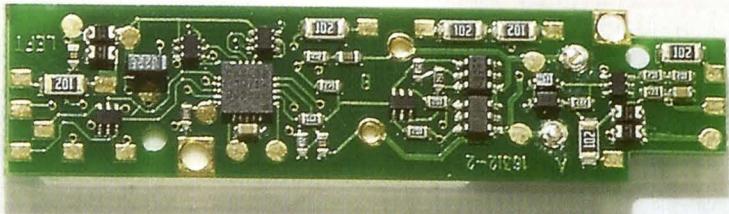
All-American service station. Laser-cut wood kit includes office and service garage. Tab-and-slot construction, peel-and-stick details, and roofing material. 5 1/2" x 6" footprint. \$42.95. American Model Builders Inc.

N scale locomotives

General Electric Dash 8-40CW diesel locomotive. Atchison, Topeka & Santa Fe; Conrail (Quality paint scheme); CSX; and



1:29-proportion 32-foot two-bay coal hopper. Large scale modelers can build a fleet of coal hoppers with the latest car from Aristo-Craft. In addition to the Baltimore & Ohio model shown, the car is available decorated for 16 other roads, as well as undecorated. The ready-to-run models have working hopper doors, a removable solid coal load, and sprung trucks, and are priced at \$80 each.



Model DN163I2 N scale DCC decoder. The latest Digital Command Control decoder from Digitrax is designed for two-wire installation in InterMountain Railway Co.'s N scale FP7 diesel locomotives. The 1.5-amp decoder features back electro-motive-force (EMF) control and retails for \$34.99.

Union Pacific. Three road numbers each. Also available undecorated (each style). Five-pole skew-wound motor with dual flywheels, Accumate magnetic knuckle couplers, and directional lighting. Direct-current model, \$139.95; with Digital Command Control, \$179.95. Master Line. May 2009. Ready-to-run. Atlas Model Railroad Co.

Electro-Motive Division SD45-2 diesel locomotive. Atchison, Topeka & Santa Fe (blue-and-yellow freight warbonnet, four road numbers available); Burlington Northern Santa Fe (blue-and-yellow small stencil scheme, four numbers); CSX (blue, yellow, and gray YN3 scheme, three numbers); Duluth, Missabe & Iron Range (arrowhead scheme, two

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SP 4-8-4 GS4 #4436	PP BAL	HO	\$500
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News & Products



HO scale Chicago & North Western covered hopper three-pack. Atlas has added a three-pack of Thrall 4,750-cubic-foot capacity grain hoppers to its Trainman line. The ready-to-run cars come in three different paint schemes, including a patch-out version. The cars feature Accumate magnetic knuckle couplers and metal wheelsets. Atlas is also offering a three-pack of Norfolk & Western coal hoppers. Both sets are priced at \$39.95.

numbers); Norfolk Southern (four road numbers); and Seaboard Coast Line (black and yellow, two numbers). Etched-metal details and Micro-Trains magnetic knuckle couplers. \$119.95. Ready-to-run. InterMountain Railway Co.

N scale freight cars



Double- and quad-plug-door auto parts boxcars. Double-door models: Grand Trunk (Detroit, Toledo & Ironton reporting marks, shown); Atchison, Topeka & Santa Fe; Chesapeake & Ohio; Chicago & North Western; Conrail (two schemes available); Denver & Rio Grande Western; Detroit, Toledo & Ironton; Louisville & Nashville; and Norfolk Southern (Southern Ry. reporting marks). Quad-door: Baltimore & Ohio, Milwaukee Road, Missouri Pacific, New York Central, and Union Pacific. Etched-metal details, magnetic knuckle couplers, and cushion draft gear (non-functioning). Single cars, \$24.95; two-packs, \$49.90. Ready-to-run. Bluford Shops

Assorted freight cars. Canadian Pacific 40-foot boxcar (Action Red); Great Northern two-bay covered hopper (Big Sky Blue); and Southern Ry. Gunderson deep-rib wood-chip gondola. Six road

numbers each; sold in single cars, two-packs, and three-packs. Prices to be announced. Spring 2009. DeLuxe Innovations

Assorted freight cars. TTX/Ferromex 89-foot tri-level closed auto racks (two road numbers available), \$38.80. Western Pacific 50-foot standard boxcar, \$18.55. Chicago, Burlington & Quincy 40-foot hi-cube boxcar, \$25.85. Disconnect log car with new log load, \$20.95. American Colloid Co. 40-foot plug-door standard boxcar, \$17.80. One number unless noted. Magne-Matic magnetic knuckle couplers. Ready-to-run. Micro-Trains Line Co.

N scale structures



Illinois Central type A depot. Laser-cut microplywood kit. White metal detail castings, peel-and-stick windows and doors, and three-tab shingles. 1 1/2" x 3" footprint. \$32.95. American Model Builders Inc.

N details and accessories

C49 transit motor coach. Eleven city transit paint schemes and three unlettered schemes.

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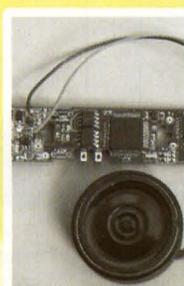
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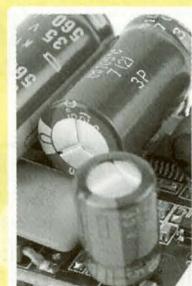
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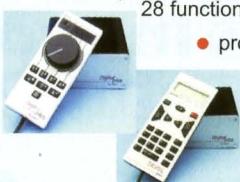
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News & Products

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O scale structures



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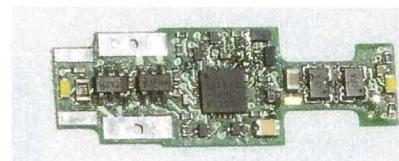


Elma Flying A gas station. Laser-cut parts, printed signs, Berkshire Valley detail parts, and Grandt Line barrels. (Vehicle shown is not included.) 4" x 7" footprint. \$87.95. Sidetrack Laser

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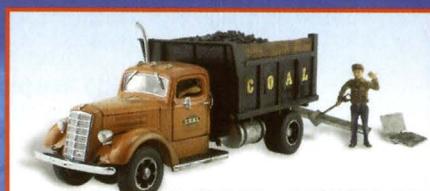


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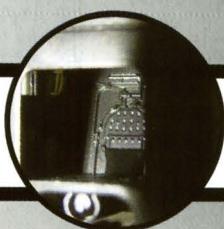
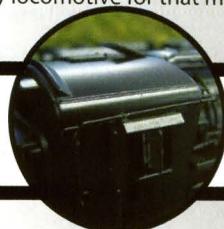


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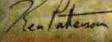
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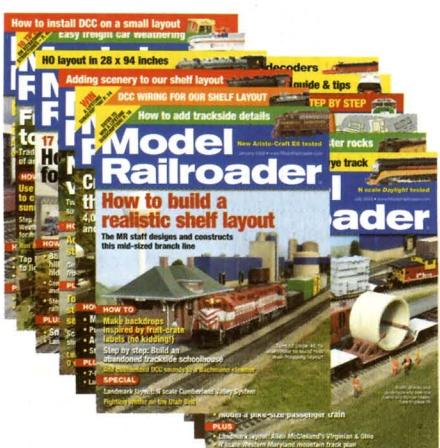


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Model Railroader 2009 Sweepstakes – Official Rules

1. No Purchase Necessary. Official entry forms are bound in the December 2008, January 2009, and February 2009 issues of *Model Railroader*. The *Model Railroader* 2009 Sweepstakes is open to residents of the United States and Canada (except Quebec) only, 18 years of age or older. Employees (and their dependents and immediate household members) of Kalmbach Publishing Co., their advertising and promotional agencies and sponsoring companies are not eligible to participate.

2. Sweepstakes Entry. To enter, complete and mail the official entry form or a postcard with name, address, city, state or province, and zip or postal code to: *Model Railroader* 2009 Sweepstakes, P.O. Box 1199, Waukesha, WI 53187-1199. Or enter online by filling in the Online Entry Form and hitting the SUBMIT ENTRY key. The Online Entry Form must be filled out completely to be eligible. Incomplete or defaced entry forms are void. One entry per household. The *Model Railroader* 2009 Sweepstakes begins on October 24, 2008 and the official ending date for the *Model Railroader* 2009 Sweepstakes will be at 11:59 pm Central Standard Time on April 1, 2009. All entries must be transmitted or postmarked no later than that date.

3. Prizes and Odds of Winning. One drawing will be held on or around May 31, 2009 for the following awards: One (1) Grand Prize consisting of a \$1,000.00 Gift Certificate redeemable at the hobby shop of the winner's choice (selected retailer must be listed in at least one yellow pages directory under "Hobby & Model Supplies – Retail") and a lifetime subscription to *Model Railroader* magazine (Estimated value \$1,073.75 based on \$42.95 per year for 25 years) (Total retail value is \$2,073.75). One (1) First Prize consisting of products from Woodland Scenics: (3) Mod-u-Rail Straight Kits (Retail value is \$135.95 each), (3) Straight Stands (Retail value is \$103.99 each), (2) Mod-u-Rail Corner Kits (Retail value is \$44.99 each), (2) Corner Stands (Retail value is \$34.99 each), and (1) City and Industry Building Set (Retail value is \$229.99). Total retail value is \$1,109.89. One (1) Second Prize consisting of a DigiTrax Super Chief 8 amp Radio Starter Set. Total retail value is \$659.99. One (1) Third Prize consisting of products from Custom Model Railroads: (1) Donaldsons Department Store in HO scale (Retail value is \$152.00) and (1) Merchants Bank & Trust Co. in HO scale (Retail value is \$173.00). Total retail value is \$325.00. Three (3) Fourth Prizes each consisting of a \$100 gift certificate from Micro-Mark. Ten (10) Fifth Prizes each consisting of a one-year subscription to *Model Railroader* (Retail value is \$42.95 each). Cash equivalents of merchandise will not be awarded. Substituting prizes is not allowed. Any applicable federal, state, and/or local taxes are the responsibility of the winner. Odds of winning depend on the number of entries received. Total circulation for *Model Railroader* is 155,106. Sweepstakes void in Quebec and void where prohibited.

4. Validation and Acceptance. Winners in the *Model Railroader* 2009 Sweepstakes will be selected in a random drawing. Canadian prize awards subject to skill test requirement. By entering the sweepstakes, participants agree to be bound by these official rules and all decisions of Kalmbach Publishing Co. Sweepstakes entries void if not legible, not completed in full, not obtained legitimately, or if forged, photocopied, mechanically reproduced, later or tampered with. The potential winners may have to sign and return an Affidavit of Eligibility, publicity release and Release of Liability within fourteen (14) days of notification. In the event of non-compliance, alternate winners will be randomly drawn. No responsibility is assumed for lost, stolen, misdirected or late entries or notifications. All sweepstakes entries become the property of Kalmbach Publishing Co. and will not be returned.

5. Winners' List. For a list of winners, send a stamped, self-addressed envelope to: *Model Railroader* 2009 Sweepstakes Winners' List, P.O. Box 1612, Waukesha, WI 53187-1612. Residents of FL, VT, and WA may omit stamp. Requests must be received by July 31, 2009. Or check the *Model Railroader* web site (www.ModelRailroader.com) after August 31, 2009.

6. Kalmbach Publishing Co. shall not be liable for any injury, loss, damage, cost or expense arising, directly or indirectly, in connection with sweepstakes and the prize awarded.

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With some simple lighting techniques, Tony Koester was able to create this dramatic shot on his Nickel Plate Road layout. Tony Koester photo

Dramatic photography

What a great photo in Tony Koester's timetable article in the January issue. How did he do it?

Mike O'Connell
Maple Valley, Wash.

[I needed a night shot for that article, as the passenger trains ran only at night, and I wanted to include a PA-1.

When it dawned on me that my Nikon digital D200's white balance would correct the usual red shift from an incandescent bulb, I simply set up the shot, turned the track power on and the room lights off, then "painted" the engines and cars with the beam of a small but powerful MagLite flashlight. Bingo! – Tony Koester, contributing editor]

Memories of Lionel

Reading Tony Koester's "Transition time" Trains of Thought column in the December MR brought back a flood of somewhat similar memories. I too had a Lionel set on a 4 x 8 sheet of plywood. When I was 13 years old, I was given MR as a birthday gift. I was hooked by the realism and the wonderful look of scale model trains.

Shortly thereafter, I traded or sold most of my Lionel for an HO engine (a Penn Line Consolidation) and some car kits. I saved a few Lionel cars, some track and my ZW transformer. When my son was five years old, I decided to get him started with Lionel. I went out and bought a starter set consisting of a steam engine, tender, and a few cars. I set it up in the basement one night before his birthday. I put one of my original 1940s cars behind the engine (a Sunoco two-dome tank car). Amazingly, the plastic engine couldn't even pull the single car on level track.

The solution was clear. I returned the new set and found a train collector who sold off the parts of his collection he didn't want at a very reasonable price. I purchased a cast-metal engine, some track, an O22 switch, and some 1950s-era cars. I think I was as happy as my

son when they all ran around the oval that I set up.

It now sits in a box in the attic, awaiting the day when my grandson will have the opportunity to be the third generation model railroader in the family!

Stephen Kreinik
Hartford, Conn.

More on gasworks

I read David Popp's problem in finding gasworks information in his "4 weeks to a bigger layout" series in the December *Model Railroader*. Google Books, which can be found at www.books.google.com, has books on many subjects, including gasworks. I searched using search terms "gasworks" and "gasholder." (A gasholder is a gas storage tank, such as the model from Walthers.)

Google Books has different book search options. I chose "full view" so that I could download the entire book (only people in the United States can download books). There are several books from the 19th and early 20th centuries on the construction and operation of gasworks.

Google Books has many books on railroads, buildings, industries. The downloadable ones go back to the early 1920s. The Internet Archive (www.archive.org) also has

downloadable books, and more are added all the time.

David Williams
Tulsa, Okla.



Learn more about tank cars in the December 2008 *Model Railroader*. Jim Forbes photo

Tank car brakes

I enjoyed the article on tank cars in the December MR. There was one point missed that might be significant to those modeling that specific time period. While type AB brakes were required for tank cars built new after 1933, existing cars with K brakes were allowed to continue to operate in interchange service until the early 1950s. So there's a twenty-year span where both types of models can operate and be correct.

Bob Kutella
Collection Curator
Illinois Railway Museum

More references to tank cars

Nice article on transition-era tank cars in *Model Railroader*. One reference you neglected to mention is *Railroad Prototype Encyclopedia*, volumes 2, 3, 7, and 10 (published by RP CYC Publishing Co.). They all have articles on tank cars.

Brian J. Carlson
Cheektowaga, N.Y.

Correction

The photo of Devils Gulch on John Allen's layout, as seen on pages 86 and 87 in the January 2009 issue, is reversed. The view should have Sims Loop on the left. The error occurred when the original transparency was scanned. – Ed.

Comments, suggestions, and additional information on MR articles and departments are welcome in this column. Every comment will be read, but not all can be printed or answered. Make your statement in 300 words or less, and send it to Railway Post Office, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail rpo@mrmag.com. Please include your name, city, and state.

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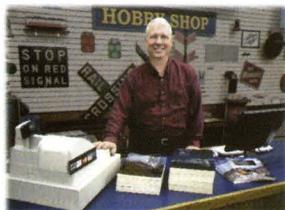
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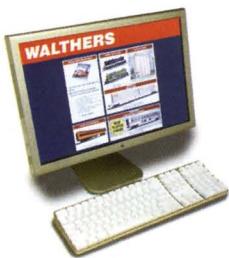


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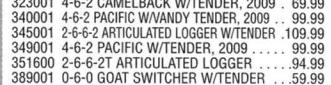
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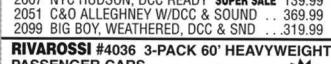
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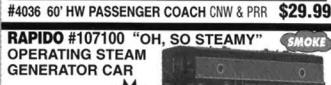
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Railroads often used wooden pile trestles to accommodate curved approaches to steel spans in the early 20th century. This former Northern Pacific bridge stands in Snohomish, Wash. Jerry Pinkapank photo

Combining wood trestles with a steel truss bridge

Will it look out of place if I combine wooden trestles with a steel truss bridge to span a river and parallel highway on my HO layout?

Roger Burke, Tucson, Ariz.

It isn't unusual for railroads to combine various types of bridges to span problem areas. The key will be to make sure the steel bridge is properly supported on piers at both ends. You also want to make sure the track passes smoothly across the bridge joints.

The piers could be a double row of pilings capped with timbers, or they could be made of masonry.

Can you explain how railroads combine their equipment rosters after a merger takes place?

John Lewis, Sidney, Neb.

By definition, mergers combine the assets, infrastructure, and equipment of two or more railroads. Naturally, the size of the companies involved plays a big role in what happens following a merger.

Combining the locomotive rosters is especially important to eliminate any duplicate engine numbers that may cause confusion in train orders, operating systems, or record keeping.

Using trestles at either end allows you to curve the approaches, but be careful to allow enough room for the locomotive and any long cars to straighten out before they enter the truss bridge in the middle. The prototype bridge in the photo also has a short steel deck truss tucked in between the curved trestle and the 1910 pin-connected truss bridge.

This combination of bridges is on a 1.21 percent grade that's part of a former Northern Pacific secondary main line. The track in this area has 112-pound rail. — *Jim Hediger, senior editor*

When the Soo Line acquired the Minneapolis, Northfield & Southern in 1982, none of the MNS units conflicted with Soo units, so there was no hurry to repaint or renumber them. Of course the Soo paint scheme and lettering was applied whenever a MNS unit went into the shops for a heavy overhaul.

As a subsidiary of the Canadian National, the Grand Trunk Western's locomotives are numbered as part of a CN system-wide plan. When GTW acquired the Detroit, Toledo & Ironton in 1980, all of its locomotives had 3-digit numbers. Renumbering was a matter of

adding a 6 prefix to the DT&I numbers to fit these units into the existing CN-GTW roster.

The Norfolk & Western's 1964 merger with the Nickel Plate and long term leasing of the Wabash; Pittsburgh & West Virginia; and Akron, Canton & Youngstown RRs took a great deal of planning to eliminate duplicate numbers. Considerable renumbering was done beforehand on the Wabash units to eliminate 4-digit numbers and its -A suffix units (NKP was already using three-digit numbers).

A second renumbering took place shortly after the merger to add a prefix number 2 to former NKP units (no. 373 became 2373) and a 3 to the Wabash units (no. 452 became 3452). The P&WV and AC&Y units were renumbered into gaps in the combined roster.

Mergers, like the Burlington Northern's consolidation of the former Chicago, Burlington & Quincy; Great Northern; Northern Pacific; and Spokane, Portland & Seattle may renumber almost everything. In these cases, similar road units are grouped by horsepower and numbered accordingly. Thus, a unit carrying a 2000-series number would be a 2,000 h.p. locomotive.

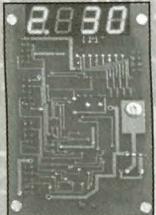
This renumbering was often accomplished by painting over the original engine number and applying the new company's initials and number on the patch. Full repaints normally waited until the unit was shopped for heavy repairs, so repainting a large fleet often took up to a decade to complete.

To prevent confusion during the renumbering, the merged companies typically include a reporting mark with the engine number. Hence, a train order would be addressed to "Extra CB&Q 176 West" to identify the unit's paint scheme until the GP40 was renumbered into the BN scheme as no. 3006. Once the patch number was applied, it became "BN 3006" until the initials were eliminated by a full repaint into BN's standard green scheme. — *J.D.H.*

Send your questions about prototype railroading to Information Desk, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail proto@mrmag.com. We regret we can't answer all the questions we receive.

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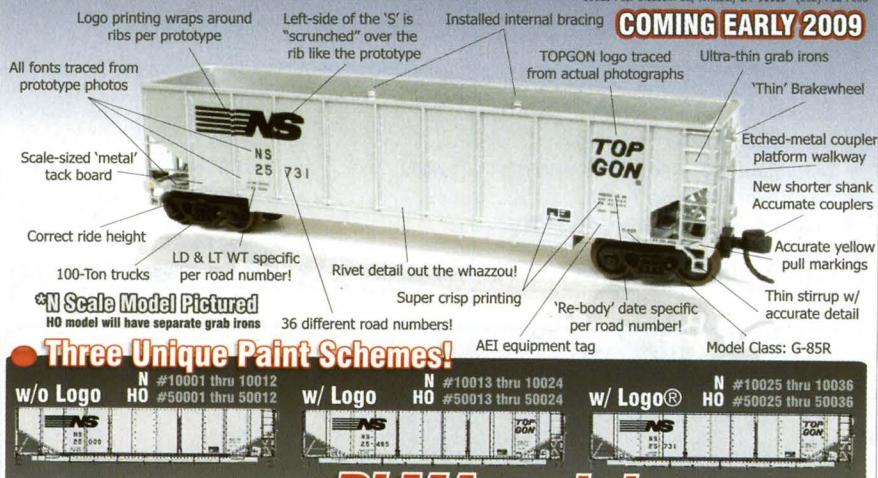
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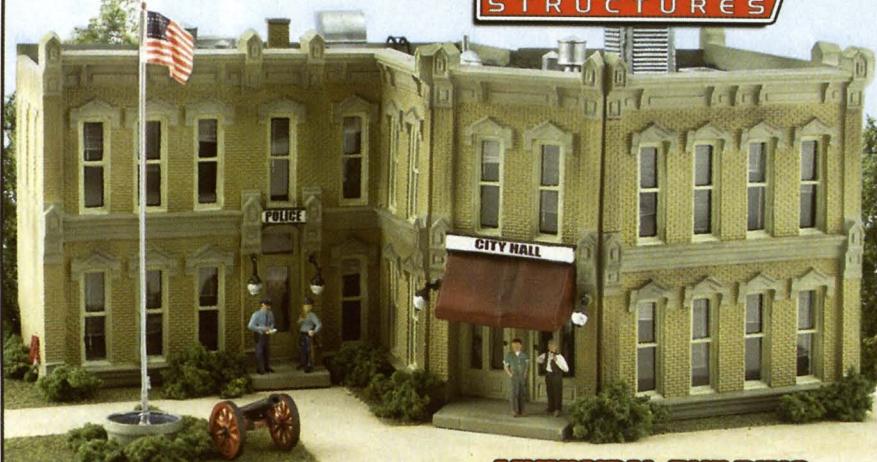
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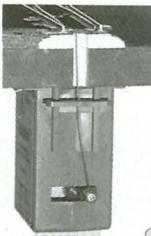
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PANEL MOUNT

Fig 2:
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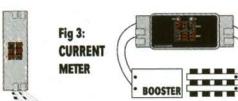


Fig 3:
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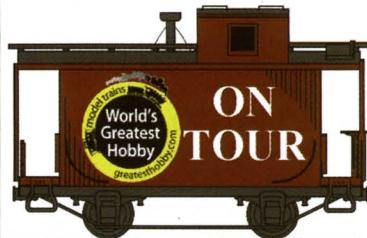


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Several sizes of containers make the transfer of loose coal loads more efficient on Lionel Strang's HO Allegheny & Lackawanna Southern.

Restaging loose coal loads

Modelers with operating layouts always seem to wind up comparing notes about techniques to make restaging more efficient. This was the case not long ago when senior editor Jim Hediger asked how I handled the restaging of the loose coal loads on my HO scale Allegheny & Lackawanna Southern RR.

My operators normally have 40 to 50 loaded hoppers to move from the mines to various destinations. In the process, a similar number of empties are returned and spotted at the mines. I've tried using one-piece cast loads, and swapping the same loaded hoppers over and over, but neither system was as satisfying as live loads. There's something about handling the live loads which gives my operators a greater sense of accomplishment as they work.

In particular, Jim was interested in any tricks I had developed to speed up the rather involved job of transferring loose coal loads. In practice it's a matter of picking up the loaded hoppers, pouring the coal into a big plastic jug, and then setting the car back on the rails.

Originally, I'd dump three or four coal loads into a medium-size container, and then load a similar number of empties until all the loads were transferred.

Some time later, longtime A&LS operator Brian Searles started to help with the restaging of the railroad. We decided the entire process



Loaded cars are dumped into the large pitcher. Then Lionel uses the blue bucket and small cup to load loose coal into empty cars without spilling it on either side of the track.

would go much faster if he unloaded hoppers into a bigger container while I was busy filling empties with the smaller bucket.

Now I pour some of the coal into a smaller container that's easier to handle as I transfer the coal with a small measuring cup "borrowed" from one of my wife's detergent boxes. This small cup was easier to control as I reached into each mine scene to load the empty cars.

As I explained this system, Jim suggested marking the standard 50 or 70-ton loads on the small cup. His suggestion made the reloading even easier, since I have both sizes of cars on the A&LS.

So now you know that even something as simple as transferring loose loads was developed over several years of trial and error and with the help of my friends. — *Lionel Strang, contributing editor*

In the Kalmbach Book *Basic Scenery for Model Railroaders*, Lou Sassi talks about a "ground goop" that he makes from a discontinued scenery product called Perma-Scene. I'm wondering if he's found a substitute to use in making his scenery goop?

Joseph Martini, Revelstoke, British Columbia, Canada

Lou Sassi's "ground goop" is a homemade papier mache filler material he applies as a base under his scenery texturing. Using goop allows him to actually plant or press scenic details and structures into the surface rather than placing them on top. The fact that it dries slowly allows the user to take his time applying other texture materials and details.

Because it's water based, goop is compatible with any scenic base including foam insulation board, plaster, and wood. Using goop over Styrofoam makes it easy to plant trees by pressing the trunks through the goop and into the foam.

Lou's current recipe is:

- 1 cup Celluclay, an instant papier mache made by Activa Products Co. (www.activaproducts.com) and sold by art supply stores
- 1 cup vermiculite, a natural clay product that's available from hardware stores and garden centers (www.vermiculite.com)
- 1 cup earth-colored latex paint
- $\frac{1}{2}$ cup white glue (Elmer's)
- 1 capful of Lysol (concentrate) or a similar disinfectant to prevent the growth of mold

Note that vermiculite replaces the old Perma-Scene in Lou's original recipe. Since the goop recipe includes white glue, additional adhesive isn't necessary. Once mixed, goop has a nearly unlimited shelf life if stored in an airtight container. Lou reports he had a mixed batch that sat on a shelf for three years. After adding a bit of water, it was ready to use.

Lou's book, *Basic Scenery for Model Railroaders*, offers numerous other ideas on how to use goop with many other products to enhance your layout. It's available from hobby dealers, Kalmbach's Customer Sales & Service by calling 800-533-6644, or on the Web at ModelRailroaderBooks.com. — *Jim Hediger, senior editor*

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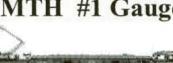
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Milwaukee, Racine & Troy GP38 no. 834 leads a cut of grain hoppers over the Milwaukee Harbor bridge. This month, Cody Grivno describes how he finished the harbor scene on the HO scale MR&T. Photos by the author

How to model a harbor

Scenes where rails meet the water have a lot of “Wow!” factor on a model railroad. On our HO scale Milwaukee, Racine & Troy club layout, one major water scene is Milwaukee Harbor. Last month, I wrote about modeling the bridges that connect downtown Milwaukee with Kelly’s Island, home to an intermodal terminal, export elevator, and cement plant. This month, I’ll cover how to install sea walls, a breakwater, and use a two-part resin to model water.

Sea walls are used in harbors to prevent water from eroding the shore. Sheet piling is commonly

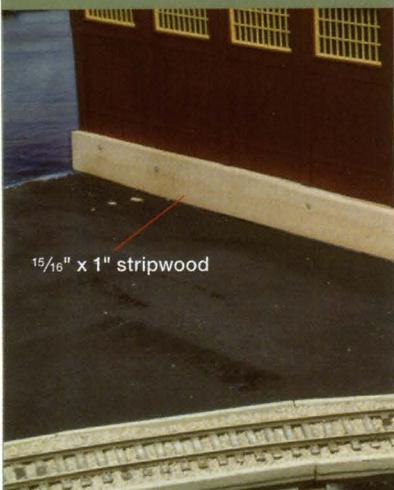
found in harbors on the Great Lakes, and since Milwaukee is on Lake Michigan, that’s what I used. Brawa produces injection-molded plastic sheet piling that’s easy to cut. See **step 2** for more information.

Breakwaters, such as the one shown in **step 4**, are common near harbors. Heavy seas can erode shorelines and make it difficult for ships to navigate safely, so breakwaters are used to slow the force of waves. The rubble-mound breakwater I modeled is just one style used on the Great Lakes.

Of course, a harbor scene on a model railroad wouldn’t be com-

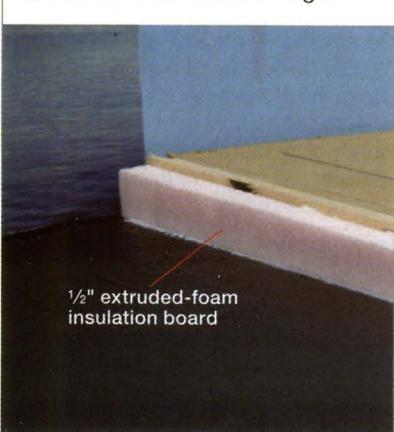
plete without water. For this project, I used Magic Water from Unreal Details, as seen in **step 5**. I’d never worked on a water project of this size using a two-part resin, so I was a bit nervous. However, by working carefully and following the manufacturer’s instructions, everything went smoothly. Once I added Woodland Scenics Water Effects to simulate waves, the harbor blended nearly seamlessly with the photo backdrop.

If you’ve never tried modeling a water scene before, give it a shot. It will give your model railroad some “Wow!” factor. **MR**

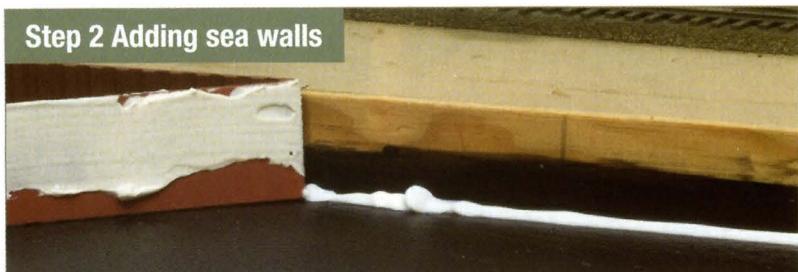
Step 1 Water meets the land

A seven-story warehouse, built by senior editor Jim Hediger (see the December 2006 issue of *Model Railroader* – Ed.), frames the harbor scene. However, the building sat right on the edge of the shore, which not only looked unrealistic but left little room to add sea walls.

To fix this problem (or so I thought), I installed $15/16$ " x 1" stripwood. After adding the wood, the building still looked too close to the water's edge.



Naturally, I was out of stripwood and the local hobby shop was closed, so I looked in the MR workshop to see what I could use to further extend the shoreline next to the warehouse. I found some 1/2" extruded-foam insulation board that fit the bill. I cut the foam with a utility knife and attached it to the stripwood with clear latex adhesive caulk. Don't use solvent-based caulk, as it will dissolve the foam.

Step 2 Adding sea walls

Next, I installed the Brawa injection-molded plastic sheet piling. I cut the walls 1/4" higher than the shore (remember, they're designed to keep the water from eroding and encroaching on the land).

I used DAP clear latex adhesive caulk to attach the walls to the layout. In the photo, you can see that I spread a generous amount of caulk on the back of the wall. I also ran a bead of caulk along the seam between the stripwood and the bottom of the harbor. The latter would help prevent the resin (see **step 5**) from leaking.



I backfilled the sea walls with Sculptamold so there would be a seamless transition between the foam, stripwood, and plywood benchwork. The paper-mache-like product works great as a scenery base and takes paint well. It has a working time of about 30 minutes.



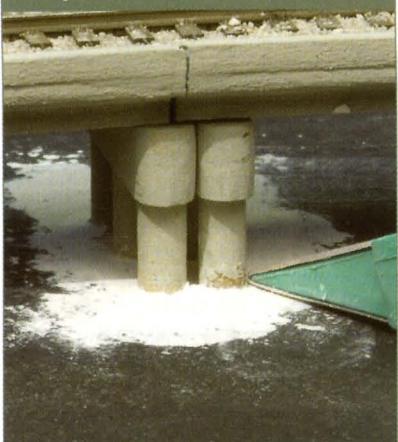
Once the Sculptamold had dried, I masked the surrounding scenery and painted the sea walls with Polly Scale Mineral Red. Though you could brush-paint the walls, I used an airbrush because it was quicker and yielded a smooth, even finish.



To re-create the high-water mark on the sheet piling, I applied washes (1 part paint to two parts 70 percent isopropyl alcohol) of Grimy Black and L&N Gray with a 1/2" paintbrush. I let the first color dry completely before applying the second.

Step by Step

Step 3 Harbor floor prep



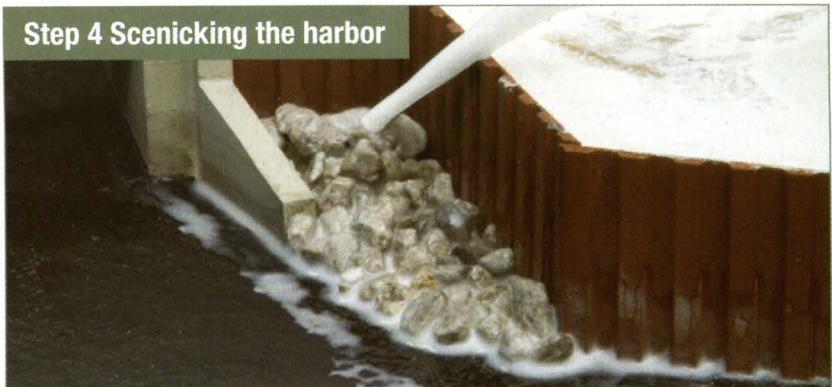
Each trestle bent has three piles. Though the middle one is seated in a hole in the plywood (which I filled from below with latex caulk to prevent the resin from leaking), I needed to blend the outer two with the bottom of the harbor. To do this, I carefully applied spackle around the base of each pile. I used a damp cotton swab to wipe any excess spackle off the piles.

I let the spackle dry for 4 hours, and then used a sanding stick to smooth the spackle around the piles. I vacuumed up the spackle dust and wiped the area with a damp sponge.

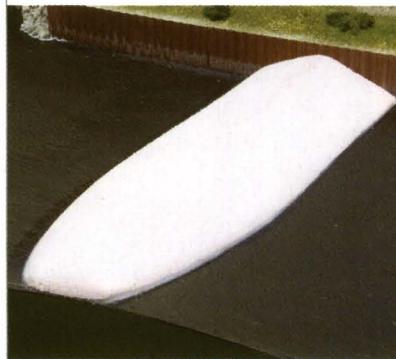


Next, I painted the bottom of the harbor with Rust-Oleum flat black latex paint. As shown in the photo, this area was painted once before, but the color was faded and had stains from scenery glue and backdrop paint, leaving this area looking tired.

Step 4 Scenicking the harbor

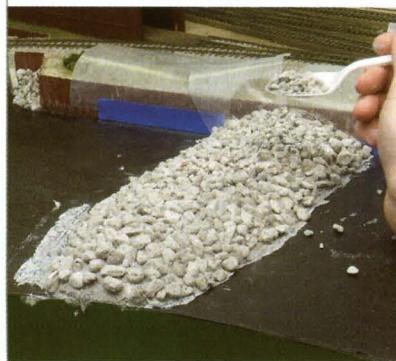


I first added Woodland Scenics coarse gray talus between the wing wall and sea walls. I soaked the talus with the firm's Scenic Cement to secure it to the layout. Do this before adding the water. If the wet glue gets under the resin, it may turn a milky color and possibly ruin the scene.



Next, I worked on the breakwater. I cut the base from extruded-foam insulation board and shaped it with a Surform rasp and flexible sanding blocks.

I attached the foam to the layout with clear latex adhesive caulk. I ran a bead of caulk along the edge of the foam to keep the resin from seeping under it.



With the Sculptamold still wet, I sprinkled on a layer of Woodland Scenics extra coarse gray talus. I gently pressed the talus into the Sculptamold with my hand. I let the Sculptamold dry thoroughly before proceeding.



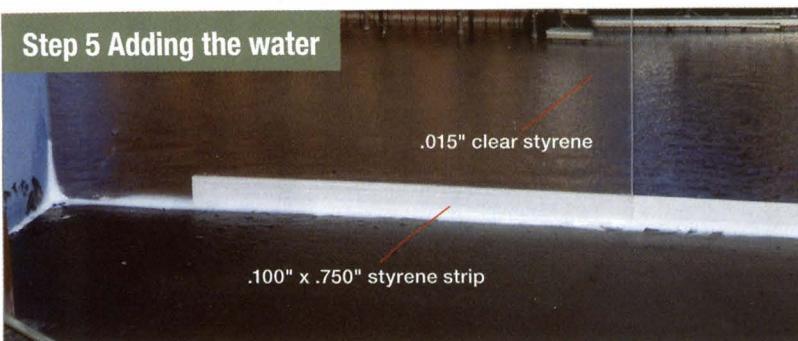
I let the caulk dry overnight before coating the foam with an $\frac{1}{8}$ " layer of Sculptamold. I tinted the Sculptamold with Polly Scale Union Pacific Dark Gray to approximate the color of the talus (see below.)

I added $\frac{1}{4}$ ounce of paint to my batch of Sculptamold, but that amount will vary depending on the size of the batch.



Finally, I used a 1" foam brush to apply a sepia ink wash (two teaspoons sepia ink, 1 pint 70 percent isopropyl alcohol) along the bottom of the breakwater. This suggests the discoloration of rocks from algae and other microorganisms.

Step 5 Adding the water



Is it time to add water? Not quite yet. First, I needed to install dams to contain the two-part resin. I cut a piece of .015" clear styrene to protect the photo backdrop. Then I ran a bead of clear latex caulk along the seam between the styrene and the bottom of the harbor.

For the rest of the harbor, I made dams from .100" x .750" styrene strip. I used masking tape to temporarily hold the strips in place, then sealed the seam between the styrene and harbor with clear latex caulk.



I filled the harbor with Magic Water from Unreal Details. The material is self-leveling, so it's important the area to be scenicked is flat. Though it's low-odor, this two-part resin should be used in a well-ventilated area. I mixed it in 6-ounce batches in a disposable cup. I tinted each batch of resin with about 30 drops of Floquil Engine Black.

I used a brass rod to guide the resin where I wanted it to go. I learned this trick from managing editor David Popp, and it works well. The rod also prevents the resin from splashing on the nearby scenery if poured straight from the cup.



Though the instructions say Magic Water will dry hard in 24 hours, ours took a bit longer because of humidity. Once the resin had hardened, I used a 1/2"-wide paintbrush to apply Woodland Scenics Water Effects. This thick, paste-like material can be used to create ripples in water and river rapids (see the July 2008 *Model Railroader*. – Ed.) The material comes out white, but dries clear. Working it in even rows suggests the waves are moving across the harbor in one direction.



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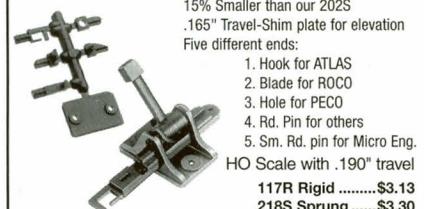
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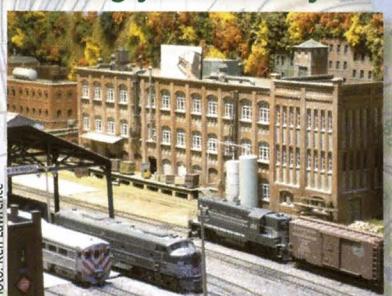


Photo: Ken Lawrence

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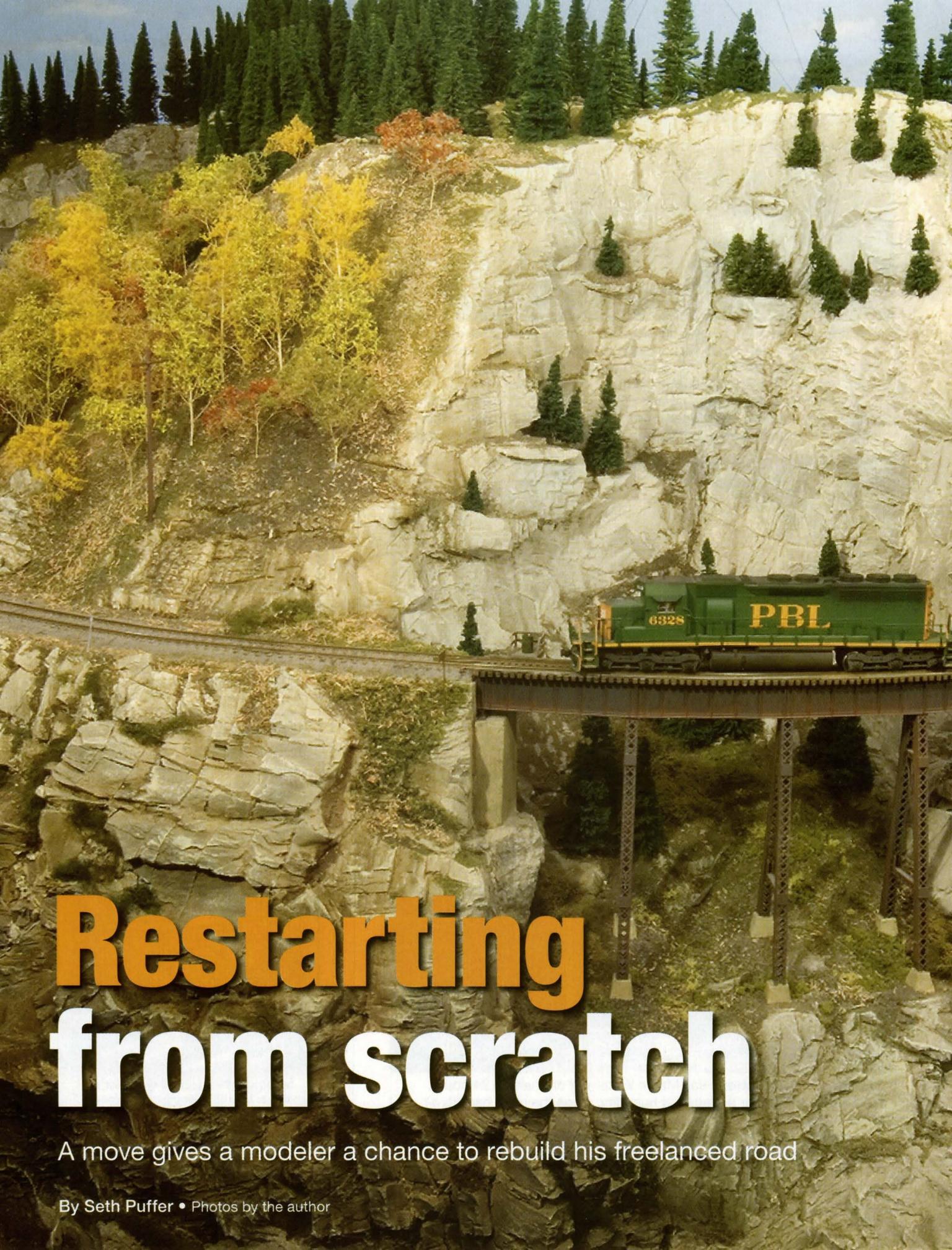
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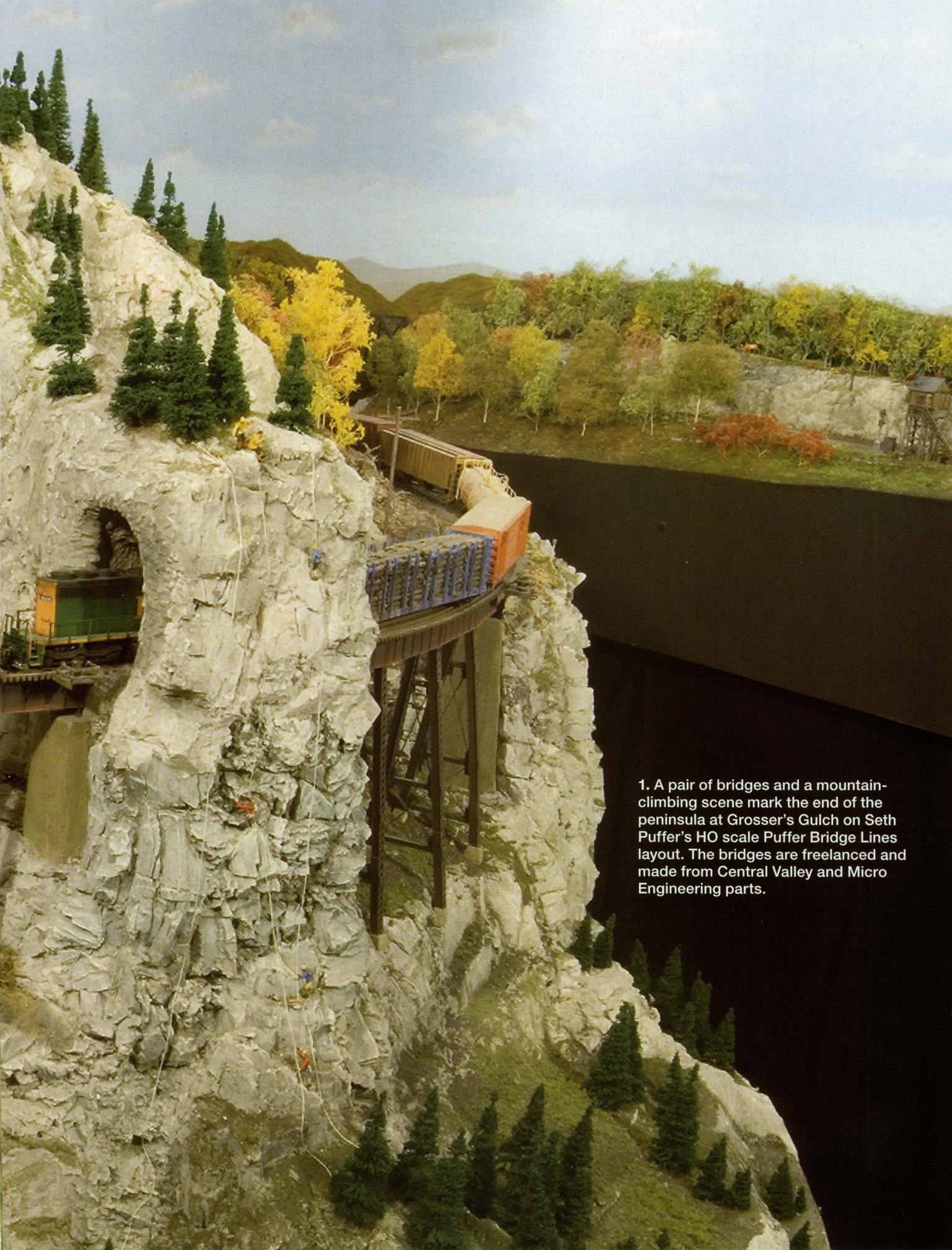
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Restarting from scratch

A move gives a modeler a chance to rebuild his freelanced road

By Seth Puffer • Photos by the author



1. A pair of bridges and a mountain-climbing scene mark the end of the peninsula at Grosser's Gulch on Seth Puffer's HO scale Puffer Bridge Lines layout. The bridges are freelanced and made from Central Valley and Micro Engineering parts.



2. Electro-Motive Division GP35 no. 716 awaits servicing alongside 2-8-0 Consolidation no. 1019 in Aurora Yard. The Consolidation is one of two Bachmann steam engines the Puffer Bridge Lines keeps around for railfan trips.

My wife and I had to make a move in early 2001, not long after I wrote about my HO scale Puffer Bridge Lines for *Great Model Railroads* 2002. This required me to dismantle and move the railroad. It was an emotionally wrenching experience to tear down the completed layout. My intention at the time was to rebuild it much as it was. I was happy with it, so why change, right?

That's where my modeling friends enter the story. They all said, "You've got a great space here. Why not use it?" That night, the railroad took its first step to what it has become today.

Shortly thereafter, I made a trip to the hobby shop, where I purchased *Model Railroad Planning 2001*. In the magazine was Robert Nicholson's plan for the Beaver Creek Mining & Transportation Co., an S scale layout. I felt that plan would fit my space well, with

room to make the additions I wanted – particularly, a large freight yard and adjacent city.

Next came the hard part for me – waiting. When we moved into our new home, the basement was unfinished. It wasn't a problem, though, as my father and brother-in-law started knocking together stud walls the day we moved in. In about 2½ months, I was surveying my new train room floor, drawing and dreaming of what would be.

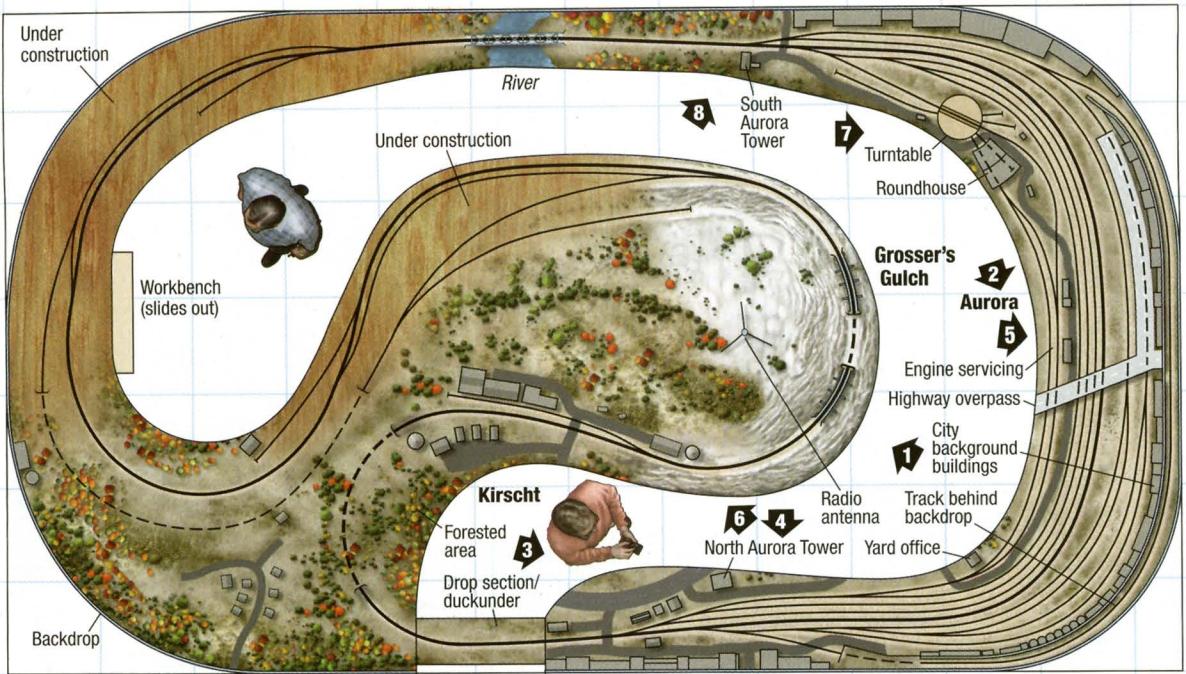


Illustration by Rick Johnson

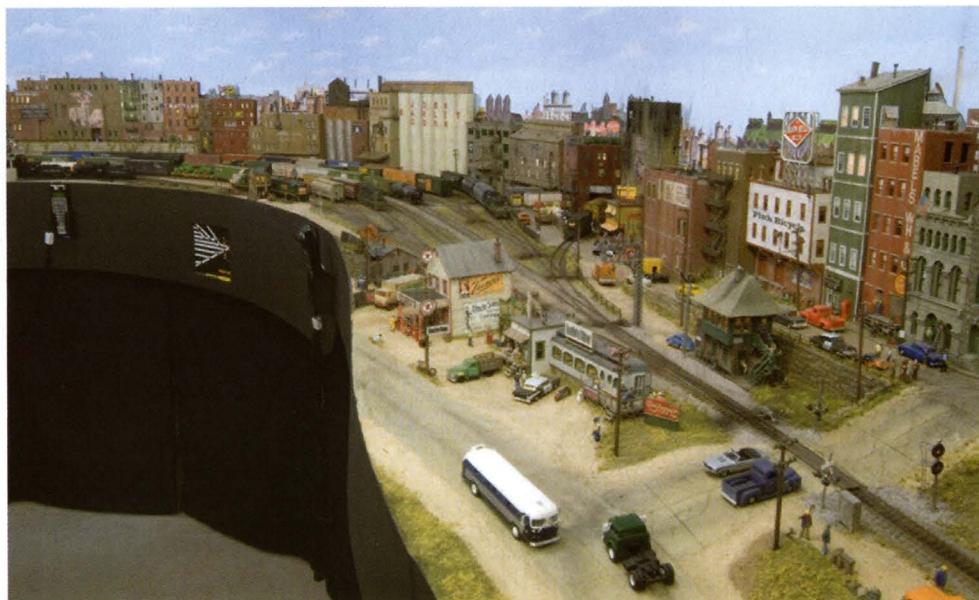
► The layout at a glance

Name: Puffer Bridge Lines
Scale: HO scale (1:87.1)
Size: 14 x 25 feet
Prototype: freelanced
Locale: freelanced United States
Era: contemporary
Style: walk around
Mainline run: 85 feet
Minimum radius: 30"
Minimum turnout: no. 6 (main), no. 4 (yards)
Maximum grade: none
Benchwork: Modified L-girder
Height: 52"
Roadbed: cork
Track: flextrack; code 83 (main), 70 (sidings), and 55 (spurs)
Scenery: Plaster cloth over cardboard lattice
Backdrop: Wallpaper backing paper over 1/8" Masonite
Control: Digitrax Digital Command Control

Benchwork

The layout space is 14 x 25 feet, and I used L-girder benchwork with some modifications to accommodate hidden staging. My benchwork puts the track about 52" above the floor, a level I prefer because of my 6'-3" height.

With friend Art VanDeWater's help, I ran 12 AWG solid copper bus wires for track power, switch machines, and structure lighting. Though I am happy with it, I wish now I had used 14 AWG



3. This view of the north end of Aurora shows many scratchbuilt and kitbashed buildings. The row of tall structures on the right conceals a hidden staging track. To de-emphasize the layout's fascia, Seth paints it black.

wire, which would be easier to connect to feeders. Solid bus wiring is essential for good operation with Digital Command Control. The main line was laid and running by early June 2001.

The backdrop is 1/8" Masonite, which is thin enough to bend easily without breaking. With the help of more friends, I surfaced it with a layer of wallpaper backing. This thick paper is meant to be applied over walls to improve adhesion of wallpaper, but I remembered

reading a piece about its use on a layout in a book by Dave Frary and Bob Hayden. The backdrop has been up for more than 6 years and hasn't split or cracked. I think that's pretty good in a climate as variable as Minnesota's.

More on our Web site

Seth Puffer's previous layout was featured in *Great Model Railroads 2002*. Subscribers can download the track plan at www.modelrailroader.com.



4. Puffer Bridge Lines RS-1 no. 33 switches spurs at North Aurora while police break up a little trouble at the Suds Bucket. Fights between patrons are a frequent problem at the biker bar. The Suds Bucket is a JL Innovative Design kit.



5. Puffer Bridge Lines GP18 no. 705 and GP35 no. 716 await their next assignments at the Aurora Yard engine terminal.

I painted the sky a subtle two-tone blue using Behr interior house paint. The clouds were added using an airbrush and cloud stencils.

Scenery, structures, and details

The basic scenery forms are made of a lattice of cardboard strips covered with two layers of plaster cloth. I spread thin layers of molding plaster on top to smooth and strengthen the scenery.

I made the rock shapes from plaster using rubber molds from Bragdon Enterprises. Once the castings had dried, I colored them with Woodland Scenics earth-tone stains in pump spray bottles. This was the first time I had tried this method, and I'm pleased with the end results. Once the stains had dried, I applied the castings to the layout, then added various ground covers and real dirt. The trees are mostly Scenic Express SuperTrees, with fall tones added. The pine trees are commercial products from a variety of manufacturers.



6. CF7 no. 2496, leading a grain train, upsets the quiet in the small mountain town of Kirscht. The railroad moves a lot of through grain trains for other roads, earning its "bridge lines" name.



7. Puffer Bridge Lines SD40 no. 6335 rides the turntable while a GP30 and an F3A get some shop time in the roundhouse at Aurora. The wood-frame roundhouse is scratchbuilt and has a detailed interior.

Next to scenery, building structures is my other favorite part of model railroading. My layout has many structures that I've modified and weathered to fit my modeling scheme, and I seldom build a model as the directions indicate. Often I'll kitbash a building to make it fit a given area or fulfill a specific purpose on the railroad.

My layout also features a number of scratchbuilt buildings. If I find that a scene needs a specific structure that's not commercially available, I'll scratch-build it. The two-stall roundhouse pictured above is a good example.

I'm a big fan of George Sellios and his fantastic, highly detailed Franklin & South Manchester HO layout. Following George's lead, I surround most of my structures with at least some fine details to add to the overall flavor of my scenes. Hundreds of figures populate my layout, and I plan to add more. I've also included dozens of cars and trucks in the scenes, and everything gets some weathering.

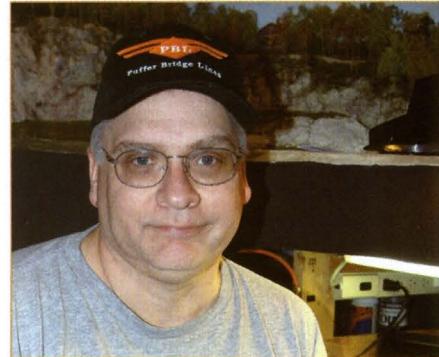
Control and electronics

Up to now, most of my time has been taken up by the construction of the layout. I hope to run the PBL with an operating scheme in the future, but my plan has not evolved yet.

I run the layout with a Digitrax Digital Command Control (DCC) system, and I've been using DCC for more than 10 years. My locomotives are equipped with a full complement of lighting effects and several have sound, which is a nice touch when showing off the layout to guests.

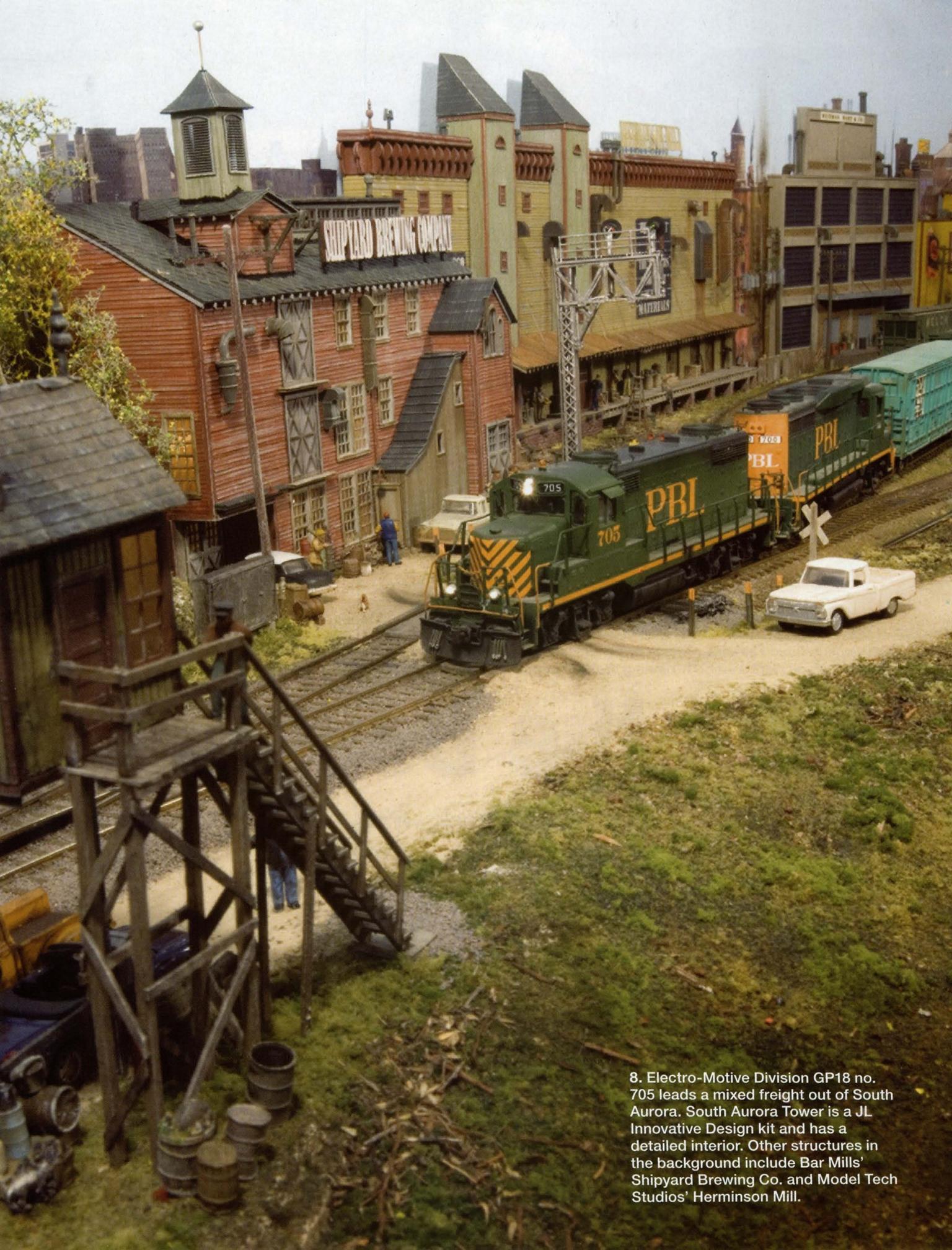
The layout isn't signaled, but I'm intrigued by the signal system offered by Digitrax. I would like to install it on the railroad someday, as a working signal system can enhance layout operation.

The new Puffer Bridge Lines is about 60 percent complete. Two towns remain to be built, and as I mull over my plans for these areas, I see the need for more scratchbuilt structures. I'm looking forward to finishing and operating my new Puffer Bridge Lines. **MR**

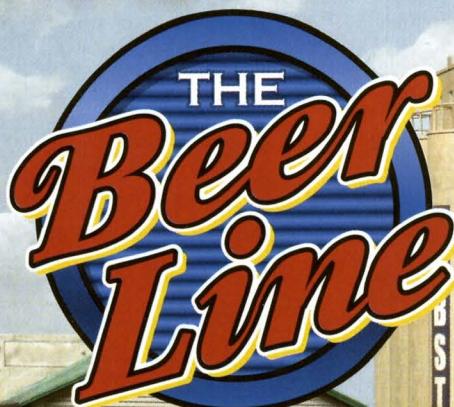


► Meet Seth Puffer

Seth Puffer is an air control technician for KSTP-KSTC TV in Minneapolis-St. Paul, Minn. He calls himself a "lifetime modeler," having received his first train set at age 5. He lives in Monticello, Minn., with his wife, Susan. In addition to model railroading, he enjoys photography and movies.



8. Electro-Motive Division GP18 no. 705 leads a mixed freight out of South Aurora. South Aurora Tower is a JL Innovative Design kit and has a detailed interior. Other structures in the background include Bar Mills' Shipyard Brewing Co. and Model Tech Studios' Herminson Mill.



A Milwaukee Road Fairbanks-Morse switcher leads a short train past the power plant. Good trackwork and wiring are important if you want a smooth-running layout that provides hours of operating enjoyment. Jim Forbes photo

Build the Beer Line

PART TWO

Roadbed, track, wiring, and Digital Command Control for our sectional layout

By Cody Grivno • Photos by the MR staff

Good trackwork and solid wiring are key if you want your model railroad to run smoothly. This is especially true on our sectional HO scale Milwaukee Road Beer Line. Because the sections can be reconfigured into oval, J-shaped, or F-shaped layouts, we needed properly aligned and correctly wired track.

Jim Hediger handled the track laying. First, he transferred the track plan to the extruded-foam insulation board. Then he attached the cork roadbed to the foam with latex adhesive caulk. Once the caulk had dried, Jim started

laying track. See page 48 to learn more about Jim's track laying techniques.

Next, Terry Thompson and Steven Otte wired the layout. For the most part, the wiring was straightforward. However, they needed a way to connect the wires between sections that wasn't dependent on how the layout was configured. Though terminal strips and plugs were considered, they used Märklin plug-and-socket connectors.

With the wiring done, Dana Kawala installed the DCC system. We used the new Bachmann Dynamis system that features two-way infrared wireless op-

eration. Read more about this new DCC system on page 51.

The Beer Line is starting to take shape. Follow along as we show you how to lay track and get trains running in Milwaukee's industrial district.

► **Build the Beer Line series**

January 2009: Track plan, layout configurations, and benchwork

Coming next month: Ballast, scenery, and the Milwaukee River

Our HO Beer Line project uses 18" radius curves and no. 5 turnouts to cram as much railroad into the space as possible. This tight radius works fine with the four-axle diesel switchers and 36- to 40-foot freight cars we used. The shorter equipment will operate well on these tight curves, but good performance depends upon smooth track.

I used a yardstick and a simple cardboard template to lay out the track centerlines. My template, visible in the upper right photo, has a 90-degree corner and an accurate 18" radius arc. Using the template allowed me to test fit each curve and make adjustments to blend it smoothly into the straightaways.

I began by finding the middle of the end section of benchwork. Then I used the template to position the 18" radius end curves so each center line was exactly 6" from the outside edge. This dimension was critical if we decided to rearrange the four layout sections. The three stub tracks also had to be inset the same 6" from the corners so they would match up whenever the layout sections were rearranged.

After the end curves were drawn, I laid out the yard and industry tracks using the turnouts as patterns. Photocopies can also be used for this step if you don't have all of your track. Just lay a pair of turnouts side by side with their rails facing the copier lens and copy a left and a right turnout on the same sheet. Use scissors to trim the turnouts as needed and tape special combinations together for later reference.

Once the center lines were marked, I ran a bead of DAP Dynaflex 230 acrylic construction adhesive down the center line and used a flexible putty knife to spread the adhesive in a thin, even layer. Then I pressed the halves of the cork roadbed into place using the centerline as a guide. I secured the cork overnight with T pins and long push pins. See the middle photo.

The following day, I used a Stanley Surform pocket plane to clean off the rough top edges and blend the cork joints into a smooth surface. This is a step that needs to be done carefully to keep the surfaces even and level, as shown in the bottom right image.

I covered the yard areas with sheet cork and used the roadbed strips for the spurs. Many of our major structures were partially built by this time, so I set them on the layout to check the footprints, siding locations, and clearances for the freight cars. – Jim Hediger



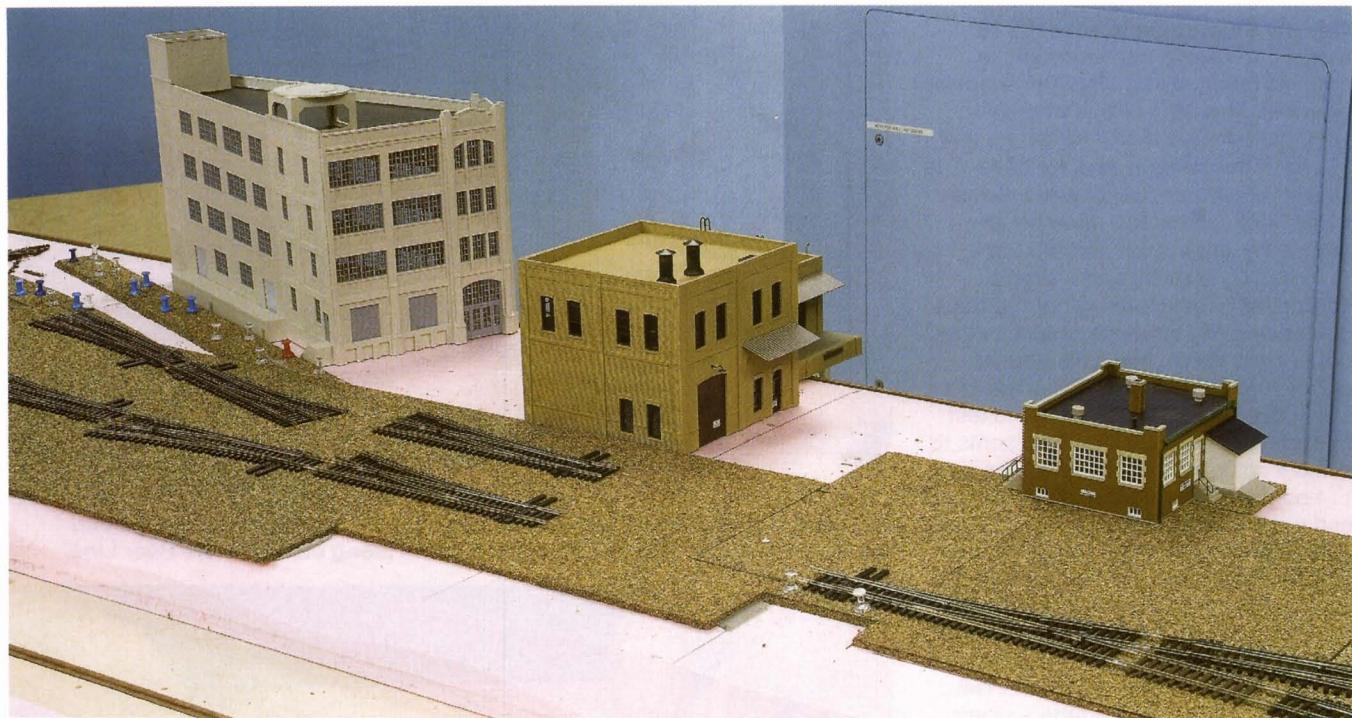
Jim used a straightedge and a cardboard curve template to locate the end curves and lay out the yard tracks and spurs along our HO scale Beer Line.



Sheet cork covers the major yard areas in our track plan while single strips underlay the other tracks. Pins temporarily secure the cork until the glue sets.



After the adhesive set overnight, Jim used a Stanley Surform pocket plane to smooth the track surface and remove any rough edges from the cork roadbed.



Jim used some of the partially finished structures as placeholders to make sure the layout's numerous industrial spurs fit as planned. The Weiser's Sausage building in the middle didn't fit and had to be modified.



To prevent problems, Jim marked the locations of switch points and headblock ties so he could keep the adhesive away from these areas. This put most of the adhesive under the frog, but the rail joiners keep the point end in alignment.

I started the trackwork by installing the three turnouts that make up the switch lead adjacent to the Humboldt Yard office (the smallest building seen in the top image). I used metal rail joiners to assemble the three turnouts and made sure they were straight. Then I applied heat to the tops of the railheads and carefully soldered the rail joints between them to convert these loose turnouts into a one-piece ladder

assembly. I used just enough heat so the solder flowed into the joiners without distorting the plastic ties. After the joints cooled, I smoothed them with a flat needle file.

Next, I used a felt-tip pen to mark the switch-point locations on the cork. I applied a thin layer of adhesive under the frog ends of the turnouts, taking care to keep the spaces under the points and headblocks free of any



A wallpaper seam roller makes it easy to apply pressure on the railheads to press the frog end into the adhesive.

adhesive, as shown in the middle left photo. If adhesive gets into this area, it will interfere with the free movement of the switch points.

I carefully set the ladder track assembly into the adhesive and aligned the track centers with the lines on the cork. A wallpaper seam roller came in handy to press the turnout down into the adhesive. See the photo above. However, I was careful to keep the roller

away from the points to avoid bending them. Then I used T-pins and push pins to secure the turnouts while the adhesive hardened overnight.

I made similar soldered assemblies for all of the other groups of turnouts including the Schlitz bottling plant lead, the Commerce Street lead, and the Milwaukee freight house turnouts. In each case, I carefully trimmed and aligned the turnouts to eliminate any kinks. My objective was to create a smooth path for the wheels to follow as they pass over the trackwork. This is the key to getting good slow-speed operation on our switching layout.

Once the adhesive hardened, I removed the pins and began cutting pieces of flextrack to fit between the turnout assemblies. See the upper right photo. This step also takes a little patience and occasional filing to get nice, tight rail joints. In general, I make the rail nippers' first cut slightly oversized. Then I make increasingly finer trim cuts and sometimes file the rail ends to get a perfect fit.

After the tracklaying was complete, I soldered the remaining rail joints (middle right image) to maintain the best electrical current flow possible. The only unsoldered joints on the layout are across the section breaks.

A final tune-up is my last step in tracklaying. I used a fine, half-round jeweler's file to smooth the tops and insides of all of the rail joints and sharpen the switch points. Sliding a thumbnail along the railhead can easily detect anything that may snag a wheel.

I used the flat side of the file to smooth the tops of the rails and inside tapered ends of the switch points. The rounded side of the file works best to smooth the sides of the railheads. The idea is to blend everything into a smooth path for the wheels. This will ensure that you can pull and push cars anywhere on the layout during switching operations.

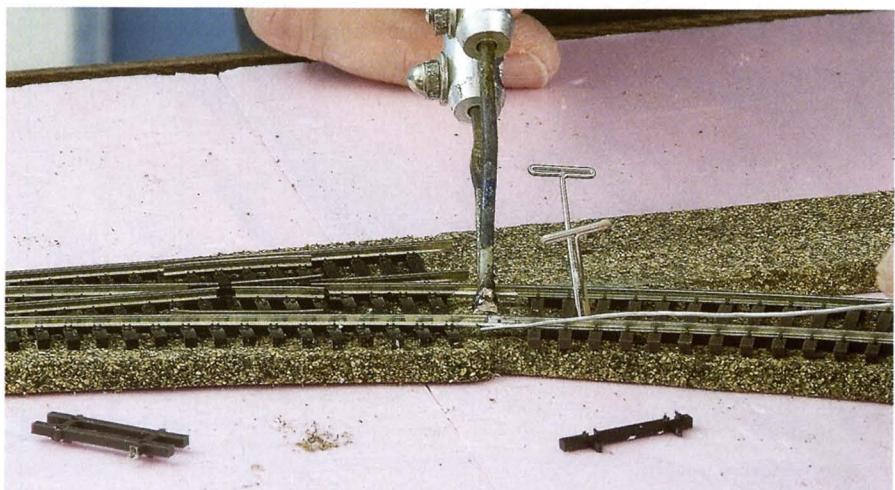
After the track was secured, associate editor Cody Grivno filled the gaps with thinned ties slipped under the rails (bottom left). He then sprayed the shiny rails and ties with Polly Scale Railroad Tie Brown for a realistic finish, as seen at lower right. — J.D.H.

More on our Web site

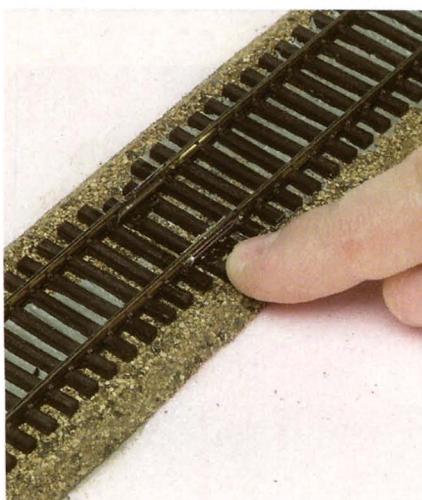
Subscribers can watch Terry Thompson wire the Milwaukee Road Beer Line. To see the video, visit www.ModelRailroader.com.



It took a good eye and several trim cuts with the rail nippers to fit the various short pieces of flextrack that join the layout's soldered turnout assemblies.



Jim applied heat from the top and removed the iron as soon as the solder flowed into the joint. This reduced overheating that can damage the plastic ties.



After the track is secured, associate editor Cody Grivno filled the gaps with thinned ties slipped under the rails.



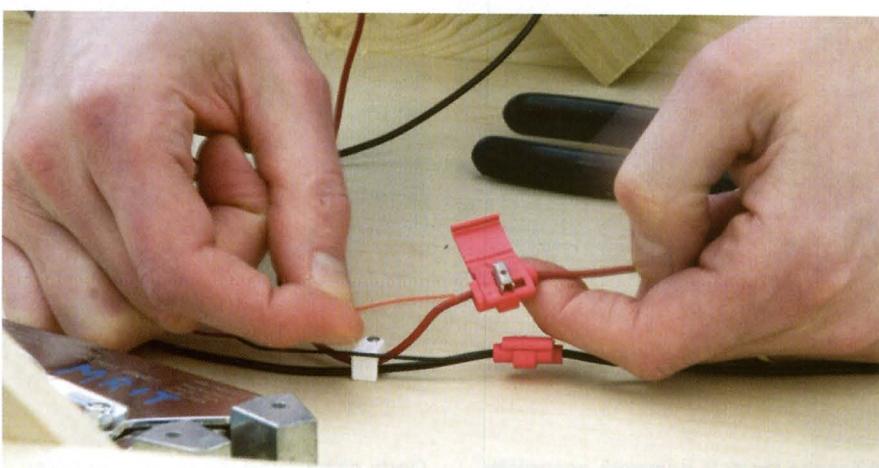
Cody airbrushed the track with Polly Scale Railroad Tie Brown to give the track a more realistic appearance.



Terry uses an extra-long bit to drill holes for the feeder wires. The long bit makes it easier to get through the extruded-foam insulation board and wood base.



Before adding the feeders, Terry tinned the rails and wires. When he was ready to add the feeder wires, he touched the location with a clean, hot soldering iron for a couple of seconds until the solder flowed.



Terry used ScotchLok suitcase connectors to attach the feeders to the bus wires. No solder is necessary when using the ScotchLok connectors.

The power and wiring on the Beer Line consists of a Bachmann Dynamis DCC system and two bus wires under the layout with feeders soldered to the rails and clipped to the bus wires. The installation was a bit more complex than on a typical small layout, but it was still a manageable project.

We started by using an extra-long drill bit to make holes through the foam and base. Once we had a hole for each feeder, we dropped the Brawa stranded copper wire (nos. 3102 and 3108) through the foam. We cut the wires to length and stripped one end. Then we brushed rosin flux on each wire and tinned it with 60/40 rosin-core solder.

Next, we cleaned the rails at the points where we wanted feeders, brushed the rails with flux, and tinned the rail with the same solder. We used a thin coat of solder on the rail. Once that was done, I took the wire in one hand and held the tinned end against the tinned rail. Then I touched it with a hot, clean soldering iron for a second or two and I was done. Clean the rails with denatured alcohol after you're done soldering to remove flux residue.

For the bus wires we used red and black 18AWG stranded copper wire. We attached the feeders to the wires with 3M ScotchLok suitcase connectors, as shown at bottom left. We clipped the connector onto the bus wire, inserted the feeder, and then used the ScotchLok Crimping Tool (a pair of pliers would also work) to press the metal connecting bar into place. Once that was set, we snapped the plastic cover around the connector.

Because the Beer Line is a sectional railroad, we needed a simple way to connect the wires that would work regardless of how we arranged the sections. After considering terminal strips and various types of plugs, we settled on Märklin plug-and-socket connectors (no. 71400). These plastic-and-metal connectors have small screws that hold them to the wires. Each plug has male and female connections, so we can connect in seconds without changing plugs or using jumper wires. We also used these plugs on the wires that connect the Bachmann Dynamis to the bus wires.

Once the wiring was complete, we tested each section to make sure there were no short circuits. We also tested all four sections together in the F, J, and oval configurations before proceeding.

— Terry Thompson



DIGITAL COMMAND CONTROL

We used the Bachmann Dynamis Digital Command Control system to operate the layout. This two-way wireless DCC system uses a line-of-sight infrared signal to communicate between the command station and the handheld throttle. [For a full review of the Dynamis DCC system, see the July 2008 *Model Railroader*. – Ed.]

Managing editor David Popp built a portable shelf for the Dynamis command base. David designed the shelf to fit securely on any of the benchwork cross braces. That way the command station can be positioned for optimal reception no matter how the layout sections are configured.

David cut the shelf from a 5" x 8" piece of $\frac{5}{8}$ " thick plywood. Then he cut two 8" lengths of 1 x 4 and glued each piece along the center of the shelf, leaving a $\frac{7}{8}$ " gap between the inside edges. The benchwork cross brace fits inside the gap, allowing the shelf to rest steadily on the cross brace. You can see the finished shelf in the upper right photo.

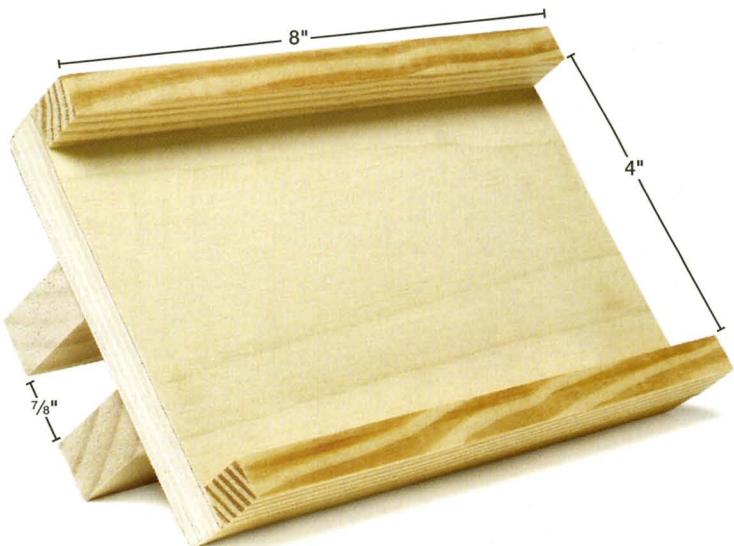
Along the front and rear edges of the shelf David cut and glued two 8" strips of $\frac{1}{2}$ " x $\frac{3}{4}$ " trim. These pieces help keep the command station from sliding off the shelf if the layout is moved.

With the shelf complete, installing the Dynamis DCC system is simple. The back of the command station has three jacks: one for the supplied 2.3-amp power supply, one that connects the command station to a terminal section of Bachmann EZ track (which I didn't use), and another for a plug-in screw terminal. I used the screw terminal to connect two power leads from the command station to the track bus.

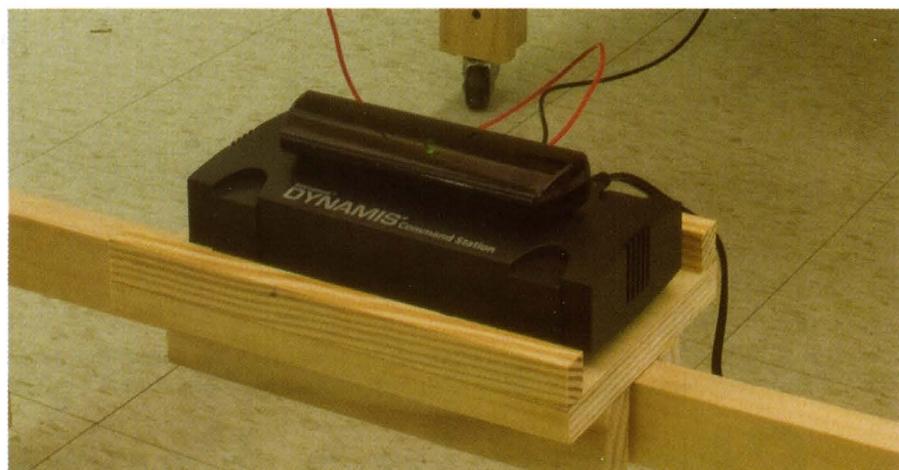
First, I cut two track leads from 18AWG stranded wire, making sure that they'd be long enough to reach the track bus from under each layout section. After stripping and tinning the ends of each wire, I added a Märklin plug-and-socket connector to one end of each lead so I could quickly attach the leads to the track bus from under each layout section. Then I installed the bare ends of the leads into the screw terminals.

After plugging in the power supply, I ran a test train. The throttle's liquid crystal display includes a signal strength indicator. The command station has a 180-degree reception arc, so I could comfortably run trains without having to constantly point the throttle downward.

– Dana Kawala



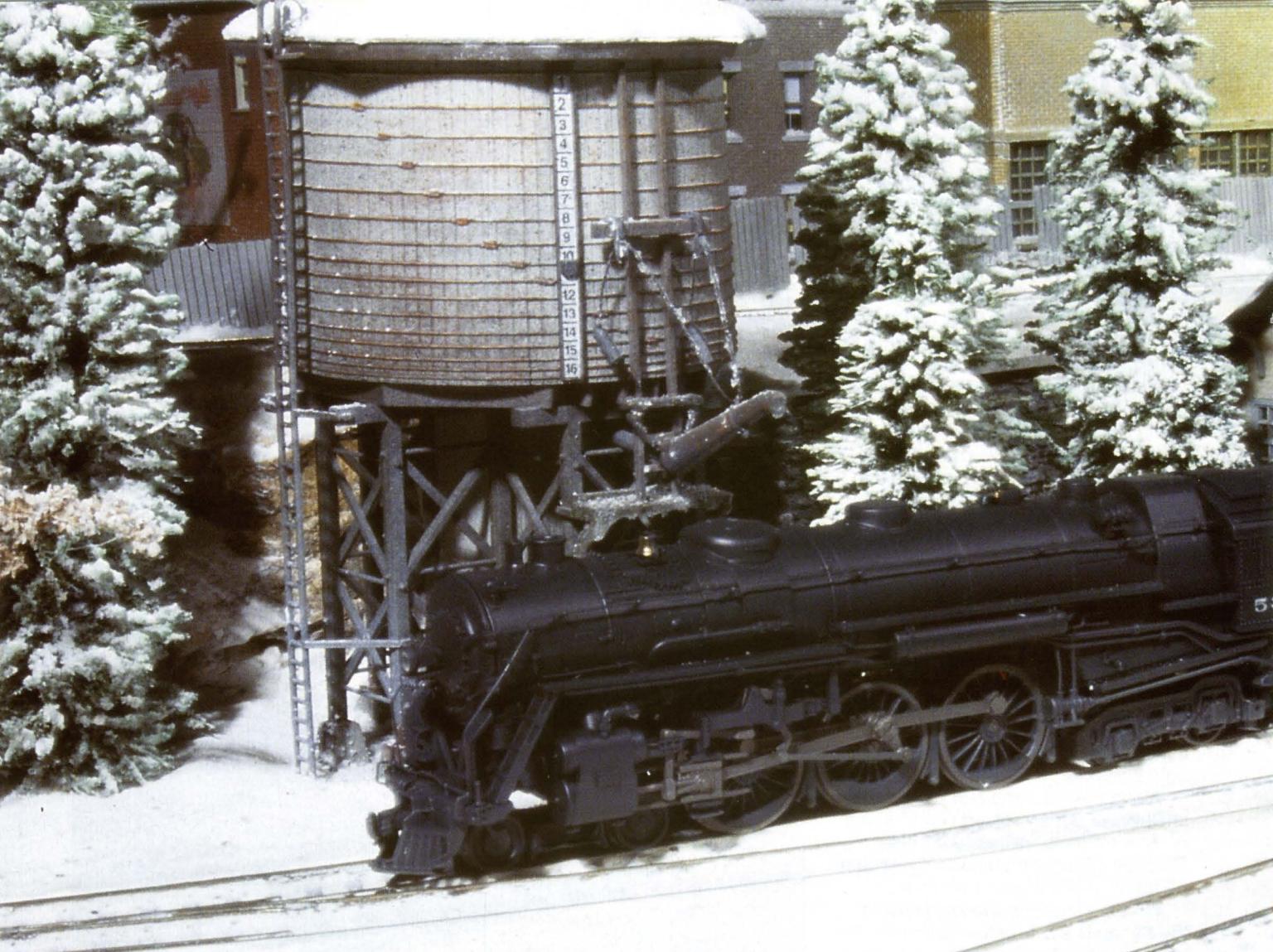
Managing editor David Popp built this portable shelf for the Dynamis command station. The shelf fits over the cross brace of a benchwork section.



We used the shelf to place the command station under the benchwork section that provides the best wireless reception. The track power leads also have plug and socket connectors for fast installation to the power bus.



Although the Dynamis system uses a line-of-sight signal, the command station's infrared receiver has a wide 180-degree reception arc.



1. New York Central no. 5344, a 4-6-4 Hudson, creeps up to the water tank at the Ethanville depot on Bill Nelson's HO scale Winter Wonderland layout. Snow-covered scenes highlight Bill's 8 x 9-foot model railroad.

Steaming through the Winter Wonderland

Snowy small-town scenes highlight this HO scale 8 x 9-foot layout

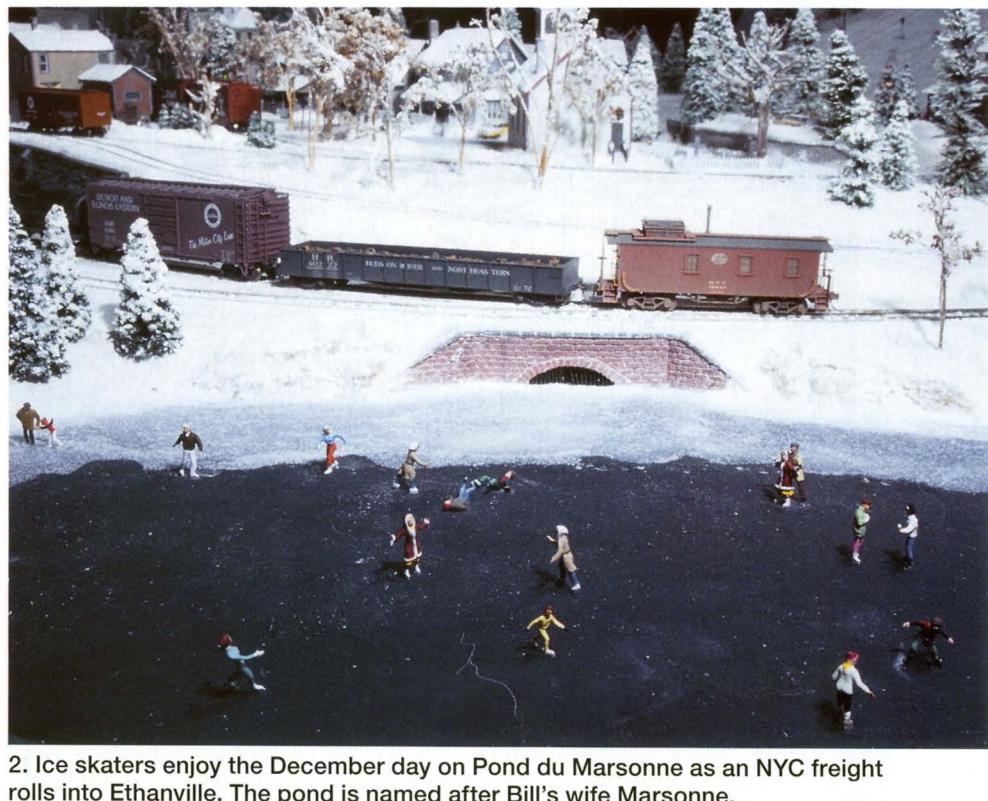
By Dave Rickaby • Photos by the author

Early memories of trains inspire many modelers. For Bill Nelson those memories revolve around growing up in a neighborhood near the Pennsylvania RR main line in Philadelphia. Along with watching real trains, Bill remembers peering

through the window of Wanamaker's Department Store at the model trains on display during the holiday season. With the help of RailDreams Inc., Bill now has an HO layout with a winter-time setting that reflects his life-long fascination with model railroading.

Downsizing

After graduating from Rice University in Houston, Texas, Bill worked for Dow Chemical in the Lone Star State. He moved the family cars outside and built a Lionel layout that filled his two-car garage. He attended auctions and



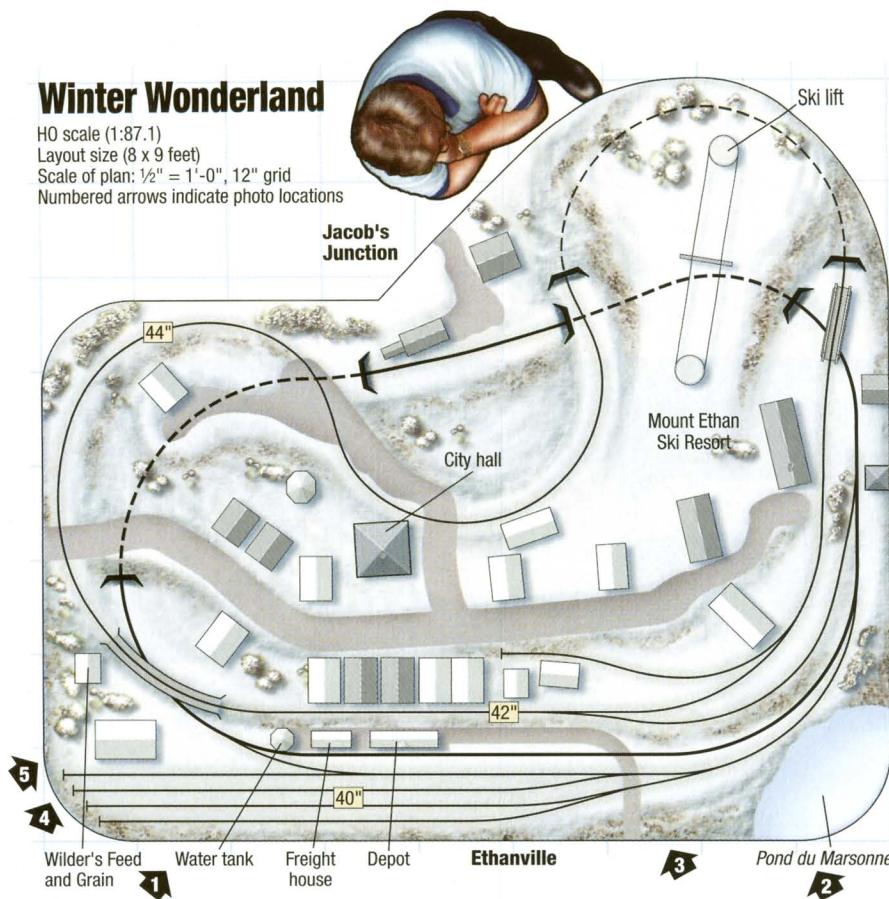
2. Ice skaters enjoy the December day on Pond du Maronne as an NYC freight rolls into Ethanville. The pond is named after Bill's wife Maronne.



3. Ready to be picked up by the local freight, a New Haven boxcar sits on a spur along Main St. on this snowy winter day. Most of the snow on the layout is made of Hydrocal sprinkled over wet Sculptamold.

Winter Wonderland

HO scale (1:87.1)
Layout size (8 x 9 feet)
Scale of plan: $1/2'' = 1'-0''$, 12" grid
Numbered arrows indicate photo locations



The layout at a glance

Name: Winter Wonderland
Scale: HO (1:87.1)
Size: 8 x 9 feet
Prototype: freelanced
Locale: eastern United States
Era: 1940s
Style: Island
Mainline run: 22 feet
Minimum radius: 18" (upper loop), 24" (lower loop)
Minimum turnout: no. 5
Maximum grade: 3 percent
Benchwork: open grid
Height: 40" to 44"
Roadbed: cork
Track: code 83 flextrack
Scenery: extruded foam
Backdrop: none
Control: NCE Corp. Digital Command Control (DCC)

be reminiscent of a Norman Rockwell painting. His HO scale Winter Wonderland would have bridges, tunnels, and even a ski slope.

Signature scenes would include the towns of Ethanville and Jacob's Junction, named for two of his sons. Ice skaters would enjoy the day on Pond du Marsonne, named for Bill's wife.

Bill planned to run more than one train at a time, so he added a Digital Command Control system to his list of layout requirements.

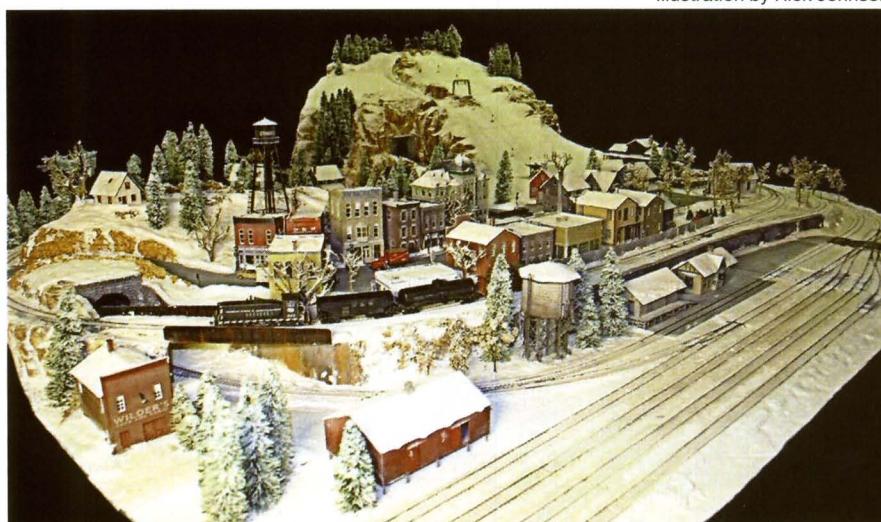
Built to order

With his ideas and list of requirements noted, Bill hired RailDreams Inc. to build his layout from benchwork to scenery. RailDreams Inc. specializes in designing and building model railroads for both commercial display and individuals. [For more information you can visit www.raildreams.com. – Ed.]

The builders started with open-grid benchwork sections made from 1" x 4" pine. A 6 x 9-foot benchwork section supports most of the layout. A 3 x 4-foot section supports the Mount Ethan ski resort.

Track and wiring work were next. All track is Walthers code 83 flextrack and turnouts laid on Midwest cork roadbed. For DCC, Bill chose an NCE Corp. PowerPro system.

Scenery contours are built up from layers of Styrofoam. The builders also carved rock faces out of Sculptamold. Because realistic snow was crucial to the layout's winter setting, the RailDreams crew spent a lot of time on this part of the scenery. [To learn the techniques used for making snow ground



4. This overall view of the layout shows the entire town of Ethanville. The ski resort in the background includes an operating ski lift. RailDreams Inc. photo

amassed a large collection of O gauge, O scale, and HO scale equipment.

By the time he and his family relocated to the Midwest, Bill no longer had a permanent layout. He mainly ran his trains during the holidays, after the snow began to fall.

During each holiday season he set up a temporary layout in the entrance-way of his home where he ran his Lionel O gauge trains. He and his wife enjoy entertaining family and friends, and the layout proved a popular attraction. Eventually Bill wanted a smaller

HO layout that he could keep set up in a permanent location.

Planning the new layout

Bill had a space in mind for the new layout under the staircase in the foyer of his home. He measured the area and sketched a rough track plan. Then Bill made a list of the specific features he wanted on the layout, including track elevations, scenery, and structures.

The layout would be set during the holidays in the 1940s. He wanted all structures and towns on the layout to



Modeling realistic snow

The builders from **RailDreams Inc.** used a combination of materials and techniques for simulating snow on Bill Nelson's Winter Wonderland layout. First they applied a base of Sculptamold to the scenery contours, building up snow banks and drifts. Most of the structure roofs also received a light application of Sculptamold.

Next the builders sprinkled Woodland Scenics Lightweight Hydrocal followed by Woodland Scenics Soft Flake Snow to the wet Sculptamold. The Hydrocal and the other ground cover adhered to the Sculptamold without any additional adhesive. Along with adding texture, the ground cover adds the sparkle of fresh snow to the scenery.

Applying the snow ground cover around the tracks was especially time consuming. The builders avoided getting Sculptamold or any of the ground cover material on the railhead or between turnout points.

The finished result looks like the real thing and exceeded Bill's expectations of how well winter scenery could be depicted on a model railroad. – D.R.

cover, see "Modeling realistic snow" on this page. – Ed.]

All the buildings and vehicles on the layout are appropriate for the 1940s. Most of Ethanville is decorated for the holiday season. Wreaths hang on doors, Christmas decorations adorn Main St., and some of the Christmas trees feature miniature lights.

The operating ski lift at the Mount Ethan Ski Resort is sold by Brawa. All the figures on the layout are from Merten or Preiser.

Bill runs both freight and passenger trains. His locomotives are lettered for the Pennsylvania RR or the New York Central RR. He hopes to soon find a PRR H-class 2-8-0 Consolidation and B-class 0-6-0 switcher for his roster.

Enjoying a Winter Wonderland

Working as a newsboy in Philadelphia, Bill delivered a lot of newspapers and set money aside until he could afford his first model train. He's been hooked on the hobby ever since.

5. A New York Central Hudson 4-6-4 crosses a deck girder bridge near Wilder's Feed and Grain. All the structures on the layout are scratch-built or built from craftsman kits, and each one has custom-printed signs.

► Meet Bill Nelson

Along with HO scale trains, Bill Nelson enjoys collecting and operating O scale models and Lionel O gauge locomotives and rolling stock. His long-term plans include building a large O gauge model railroad.

The CEO of Harris Data in Wisconsin, Bill and his family live in the Chicagoland area.

Today he has a model railroad that celebrates his favorite setting and time of year as well as reminds him of days gone by. Bill enjoys sharing the layout with visitors who marvel at the details in each scene. Like many model railroaders, Bill dreams of having a larger layout someday, but for now he's quite content to run trains through his HO scale Winter Wonderland. **MR**

Dave Rickaby is a regular contributor to Model Railroader.

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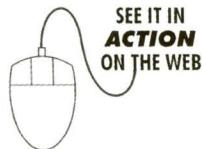


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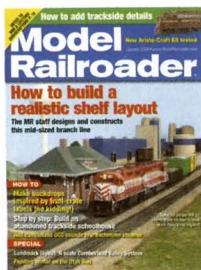
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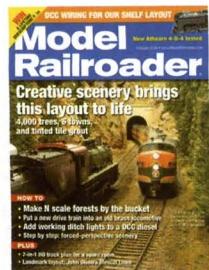
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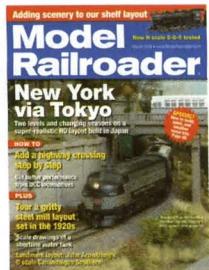
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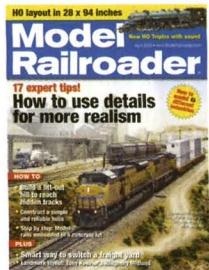
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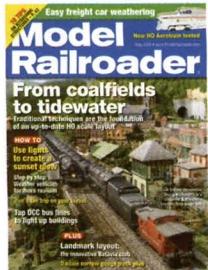
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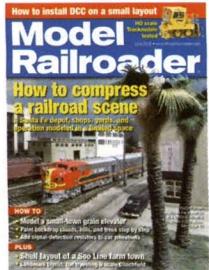
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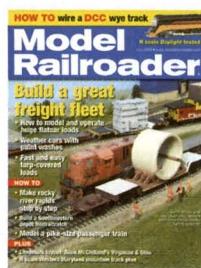
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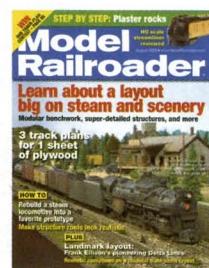
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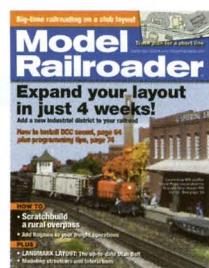
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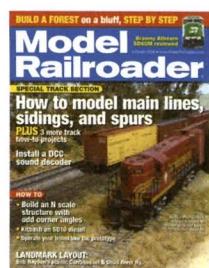
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Bill Neale added purpose to his HO layout's operating sessions by using plastic sleeves, computer printed labels, and waybills to upgrade his car forwarding system. The large letters on the file match the town codes printed on the waybills.

Plastic pockets improve waybill operation

An update for a popular manual car card and waybill system

By Bill Neale • Photos by Scott Kremer

Over the years, model railroaders have used a variety of systems to provide structure and purpose for the movement of cars on their railroads. Every prototype freight car moves for a reason, beginning with an empty car heading to a location where it's loaded. The car then travels to another destination where its load is delivered. Once it's unloaded, the car's cycle begins again.

During their travels, freight cars may be switched numerous times as they're classified, cleaned, inspected, partially unloaded and reloaded, repaired, and weighed. Tracing the movements of an individual freight car can be difficult, but we need to only simulate part of this complexity to generate traffic for our model railroads. Our models seldom carry anything, but we still want to simulate realistic operation.

Car-card-and-waybill basics

The original Doug Smith car card system was published in the December 1961 *Model Railroader*, and it's still a viable and popular system. His basic procedures have evolved somewhat, but Doug's original concept remains valid.

This system uses a car card to represent each car on the railroad. At a minimum, the car card has the reporting marks (ownership initials and number)

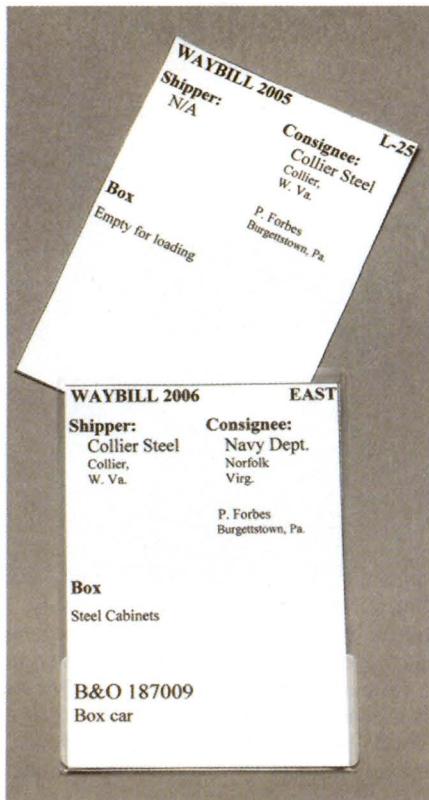


Fig. 1 Car pockets and waybills. A printed label turns a plastic baseball card sleeve into a flexible car pocket that can easily hold a handful of waybills. Several single-sided waybills can be used to route the matching freight car to a variety of destinations on the layout or into a staging yard.

and car type (boxcar, gondola, and so on). Some modelers expand this information with car type codes, commodity restrictions, specific car assignments, or a picture of the car. A few modelers also keep a maintenance record on the back of the card.

These car cards include a pocket to hold a smaller waybill card that provides information on the car's next destination. This pocket can be made by folding the car card and taping the edges, or by taping a clear plastic window over part of the car card. The waybill inserted into the pocket lists the car's load, destination, and routing information. The combined car card and waybill determines where each car on the railroad will travel.

Making car cards with pockets for all the cars on my HO scale Pennsylvania RR looked like a big task. I also disliked handling train-size packets of car cards with waybills sticking out of one end. These stacks tend to be much thicker at the end with the multiple layers of car cards and waybills, making the pile easy to mishandle or drop. I started to look for a better alternative.

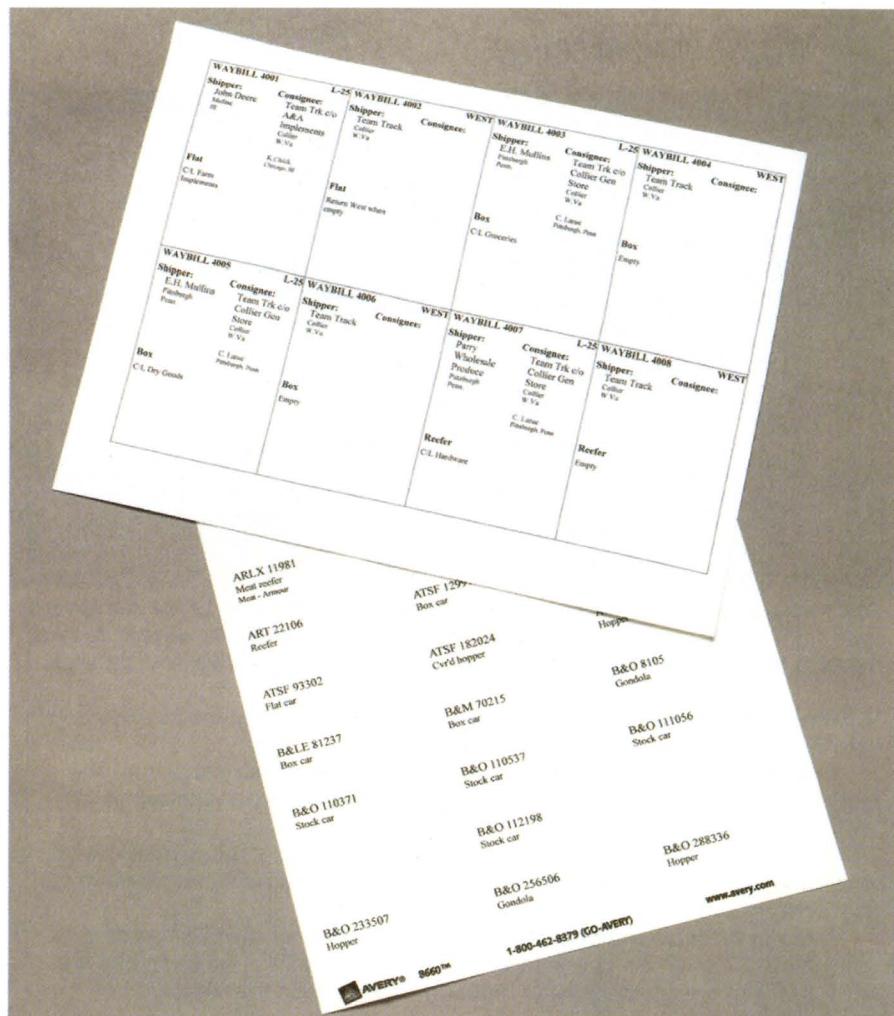


Fig. 2 Gang printing. Bill used his computer to typeset and print sheets of eight waybill cards (top) and 30 reporting mark labels (bottom) for the car pockets. The exact format of these items isn't important, but they do need to be uniform.

Baseball cards to the rescue

Along the way, I realized that I could update Doug Smith's car card system by replacing his original 3" x 5" car card with a labeled, clear plastic pocket that would hold the 2 1/2" x 3" waybill inserts. I began searching for a source of economical, easy-to-obtain, commercial card holders that would withstand the considerable handling they receive.

I looked at a variety of clear plastic pockets used to hold all sorts of sales tags, business cards, and photos that would work. But all of them had minor drawbacks or high costs.

Since I was starting from scratch, I decided to go down a different path and found several companies that supplied clear plastic sleeves and boxes for baseball card collectors. Each baseball card is 2 1/2" x 3 1/2", which is just about a perfect size for waybills. These protective sleeves are made of thin polypropylene, a tough, flexible plastic, with three sealed edges and overall outside measurements of 2 5/8" x 3 5/8". See **fig. 1**.

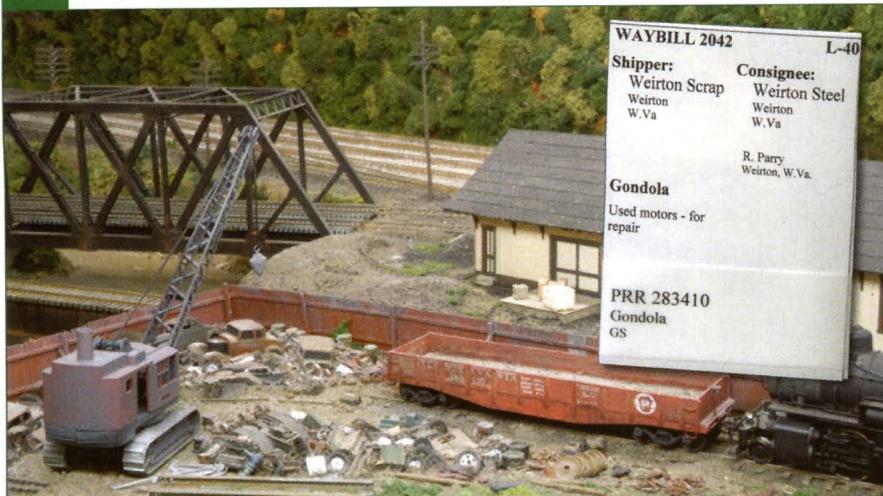
Several manufacturers sell sheets of factory-cut clear computer labels that measure 2 5/8" x 1". This size just fits across the baseball card sleeve, and the 1" height is more than enough space to print a legible car description, car usage information, and even a picture of the car if desired. I prefer to use the clear plastic labels (Avery no. 5660) for this rather than white paper labels because they're more durable.

I attached a printed label on the outside of a sleeve to create what I call a "car pocket." Then, I insert one or more waybills into each car pocket.

I had listed my freight car roster on a computer spreadsheet, sorted by reporting marks, so I directed it to the printer as a series of labels, **fig. 2**, using my computer's mail-merge functions to print one label per car.

When I applied the labels to the car pockets, I kept everything in the same order as I printed them by road and car number. That made it easier to match the pockets to the cars on the layout

Waybill system set-up



Bill's upgraded car forwarding system routes this gondola to the scrapyard and then sends it on its way according to the routing on the waybill. A clear label at the bottom of the card pocket lists the reporting marks and car type.

Getting started with waybills is mostly a matter of breaking the process down into six steps:

1. Write the waybills one town at a time and one industry at a time. The majority of my car routings are from staging to an industry on the layout, or from an industry to staging.

2. Print and trim the waybills. After making sure all of the printed waybill sheets were stacked the same, I took them to a local Kinko's to have them cut to a uniform size.

3. Make through waybills. I made a large number of waybills routed with only the EAST or WEST codes to simulate through traffic. These waybills are for trains with blocks of cars that regularly travel across the railroad from staging to staging.

4. Build waybill files. I made my own town files from styrene, as in **fig 4**.

5. Print the car labels and attach them to the car sleeves.

6. Distribute the waybills town-by-town, putting appropriate destinations into the car pockets in all the bill boxes.

Run operating sessions and make adjustments as required. – B.N.

during the initial setup. Note that the initial setup of a card system can be a bit daunting, so having the pockets in some sort of order makes the process easier.

System flexibility

I use single-sided waybills with my car pockets, **fig. 2**, in contrast to Doug's system that requires operators to flip the waybill over or turn it upside down. Whenever one of my cars reaches the destination on its visible waybill, that waybill is pulled and slipped into the back of the stack in the pocket.

Of course, you can always pull the waybill out of the pocket and start a new cycle with a different waybill. This flexibility allows me to use any number of moves in a waybill stack, within the limits of the car pocket's capacity.

To simulate a PRR operating practice, I needed some three-cycle waybills.

On double-track lines, each main track had an assigned direction of travel. The local freights would work the spurs on only one side of the main line, while another train in the opposite direction serviced the spurs on the other side.

By using three waybills in the pocket, I get three movement cycles that initially route the empty car to a shipper. The second bill takes the loaded car "off-line" into staging at one end of the railroad. Then the third waybill brings the car back on line as an empty returning in the opposite direction so it can begin another cycle.

To provide variety, I have some cars that move with only a single waybill, and I change the bills after the car arrives in staging. I also have cars that travel with five waybills in the pocket. However, each operator sees only the top destination, so the following trips remain out of sight in the stack.

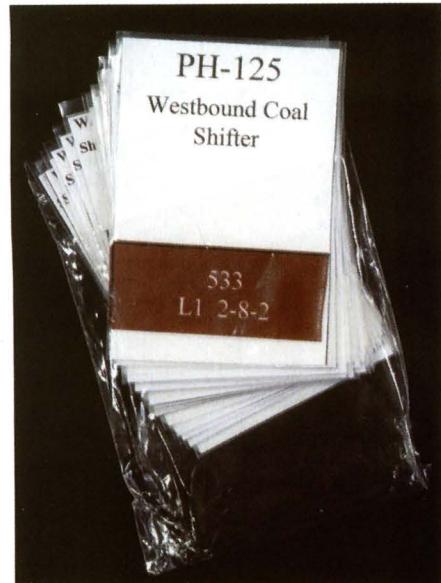


Fig. 3 Train pack. As each consist is made up, the outbound waybill pockets are stacked in sequence and placed in a resealable train pack. The top pocket is labeled with the assigned locomotive's number, class, and type while its insert displays the train identification.

Waybill preparation

My individual waybills fit into the car pockets and display information on the car's future destinations. Each of my waybills has the shipper or point of origin printed on the left side, and the consignee or destination on the right side. I used Microsoft's Excel and mail-merge functions to create these cards. Each waybill card had to be two Excel rows wide to print properly, but following my format isn't important as long as the necessary data is there.

My waybills have a four-digit code printed in the upper right corner that indicates a town or staged destination. Cars routed to the end staging yards are coded EAST or WEST on their waybills. Each town on the layout has an "L-00" code (L for local and a number). The first town is L-10, the second is L-20 and so on. These codes are provided to simplify the switching.

I printed my waybills on cardstock, but I could have used a heavy paper. The baseball card sleeves keep the waybills clean, so using the cardstock isn't necessary, but I like the feel of the heavier paper as I handle the waybills.

Materials

The baseball card sleeves cost about a penny each, but the labels are more expensive. However, these are one-time costs. I also found the same sources that market the card sleeves also sell "team bags." These are resealable bags meant to hold 30 to 40 baseball cards,

but they're also great for holding all the car cards in a train pack.

The first item in each train pack is usually an engine pocket, **fig. 3**, with a card listing the train assignment instead of a waybill. This combination identifies the train and specific engine number so the operator can easily make his DCC throttle assignment.

Baseball card collectors use a variety of other boxes and plastic organizers to store their collections. Many of these items are handy for model railroad purposes. I use a storage box sized for 200 cards to hold any waybills that aren't in use.

I didn't find any commercially available file boxes to mount on the side of the layout for the town files, so I made them myself. Each compartment in the file boxes is $2\frac{3}{4}$ " square and $\frac{1}{2}$ " deep with a clear front. See **fig. 4**. This allows the waybills to stick up enough for easy handling. Since the waybills and pockets are slim, the $\frac{1}{2}$ " depth holds plenty of them. I labeled each of these boxes with printed SET OUT, HOLD, OFF SPOT, or PICK UP labels on the same label stock used for the car pockets, as seen in the photo on page 62.

Baseball card material sources

A Google search of "baseball cards" will deliver about 7,000,000 potential sources of baseball card collecting supplies. Take your pick.

I have purchased useful items from BCW Supplies (www.bcwsupplies.com) and the Baseball Card Supply Shop (baseballcardshop.net/toplosolsir.html).

An improved concept

The continuing popularity of Doug Smith's car card and waybill system has brought many new modelers into the realm of realistic model railroad operations. Much of this popularity comes from the system's easy setup and operating procedures.

My upgraded version makes use of my personal computer to eliminate most of the system's tedious initial setup work and streamline the waybill preparation. The flexible plastic pockets are much sturdier and keep the waybills clean. Since the car pocket holds multiple waybills, the paperwork is reduced to simply moving the top waybill to the back of the pile as each destination is reached. **MR**

Bill Neale has been building his 1950s-era 22 x 25-foot Pennsylvania RR Panhandle Division for more than 20 years. He and his wife, Terry, have two grown children, Jenny and Carrie. They reside in suburban Detroit.

Car forwarding systems

There are six popular car forwarding systems that I considered as I began developing a system for my HO scale Pennsylvania RR. Each of these methods has its own strengths and weaknesses, which I've listed below:

1. Hand-written switch lists

Pros: Printed forms have a realistic appearance that's often based on prototype documents.

Cons: Intensive time-consuming clerical work. Arriving cars don't have predetermined routing unless the lists are used with a waybill system.

2. One-for-one car swaps

Pros: Quick setup and insensitive to individual car reporting marks.

Cons: Realism suffers as the crew decides which specific cars to move. Cars arrive without specific destinations so classification is a problem.

3. Computer-generated switch lists

Pros: Almost as realistic as hand-written switch lists, and may be quickly generated as needed. Most prototype railroads now use them.

Cons: Preprinted switch lists are difficult to correct. The inclusion of any yard work adds substantially to the complexity of a computer system.

4. Rooftop markers on cars

Pros: Easy setup and operation with minimal preparation time.

Cons: Unrealistic tacks or markers sit on top of every car.

5. Car cards with serial routes

Pros: Initial setup takes time, but then requires few adjustments between operating sessions.

Cons: Realism suffers when the operators can see the car's future moves, and must advance or mark a position indicator during the session. It's also difficult to re-route cars to fill a simulated shipper demand.

6. Car cards and waybills

Pros: A realistic simulation of prototype paperwork without the need to write switch lists.

Cons: Some clerical work is necessary and initial setup is more difficult. Waybills may have to be turned or moved between operating sessions to properly display each car's next destination.

I've operated on other layouts and experimented with many of these systems over the years, and the two-part car-card-and-waybill system remains my favorite. —B.N.

Fig. 4 Town file box

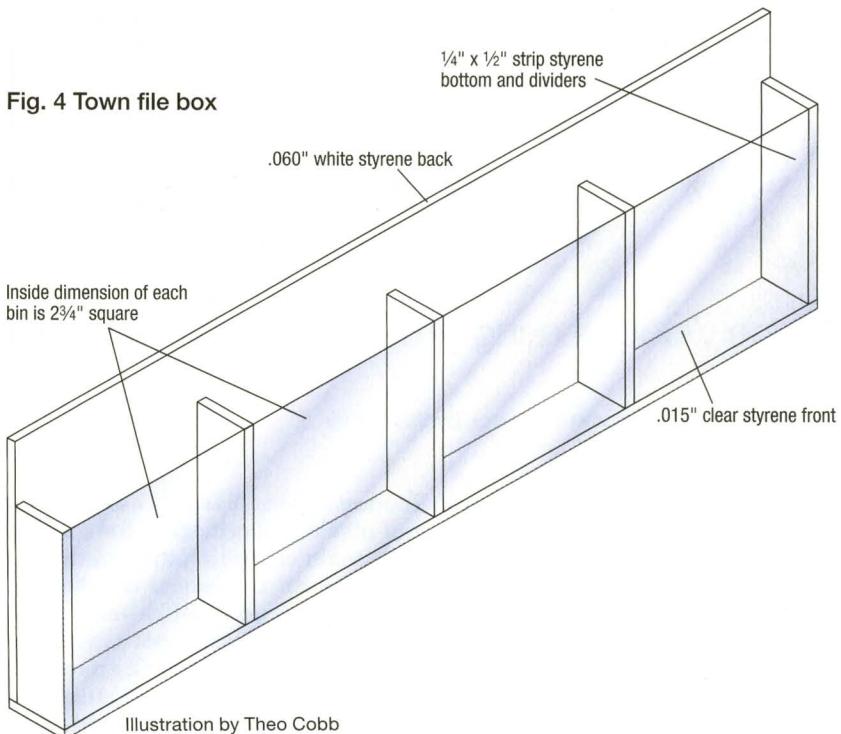


Illustration by Theo Cobb



Make a coffee table for your railroad

Machine woodworking produces a great-looking piece of furniture

By Stephen F. Anderson • Photos by the author

My wife had no idea what she was starting when she mentioned that our family room coffee table had seen better days. Her request immediately got me thinking about how I could build a new coffee table – with a small model railroad inside!

My goals for the table were simple. It had to look nice, fit in with the existing furniture I'd already built, and be

modest in size. Easy access to the layout inside was necessary for construction, maintenance, train operation, and resolving an occasional derailment. I wanted it to be a coffee table with a model railroad inside, not a model railroad with a table wrapped around it.

The table needed to be sturdy and functional, with a glass top and a place to store books and magazines.

Features

I used oak for the table because I love to work with it, and it matches my existing furniture. The layout sits in a drawer, so I can work on it outside the table. I could even build an entirely new layout at a future date and just slide it into the table. The power pack and control panel are hidden in another drawer under the layout.



Stephen Anderson's finished coffee table is a beautiful piece of furniture. His version contains a 2 x 4-foot N scale layout, but the table could also hold a compact layout in other scales.

My layout is built in N scale, but most 2 x 4-foot or smaller track plans will fit into this table. Their scale isn't important as long as the trains clear the interior of the drawer. I knew that visitors who aren't modelers would be operating the layout, so I kept it as easy to control as possible.

A woodworking project

The techniques I'll cover are a little complicated for a novice, and to duplicate the table as shown you'll need to use a jointer, lathe, table saw, router, clamps, and other tools. If you don't have machine woodworking experience, I suggest taking a woodworking course at a junior college or trade school to learn the proper skills.

Most experienced woodworkers can follow the detailed plans to duplicate the table, so I'll concentrate on explaining the special techniques I used. The table's dimensions can be changed to



Fig. 1 Basic table. Here's the assembled table ready for the addition of the layout drawer. The layout base slides into the grooves cut into the side and ends.



Fig. 2 Layout drawer. The long front of the coffee table (left) is attached to the plywood layout base that slides into the table. When the layout base is closed, both end joints are neatly concealed behind the turned legs.

fit different-size layouts, but don't forget that the compact size is part of this coffee table's appeal.

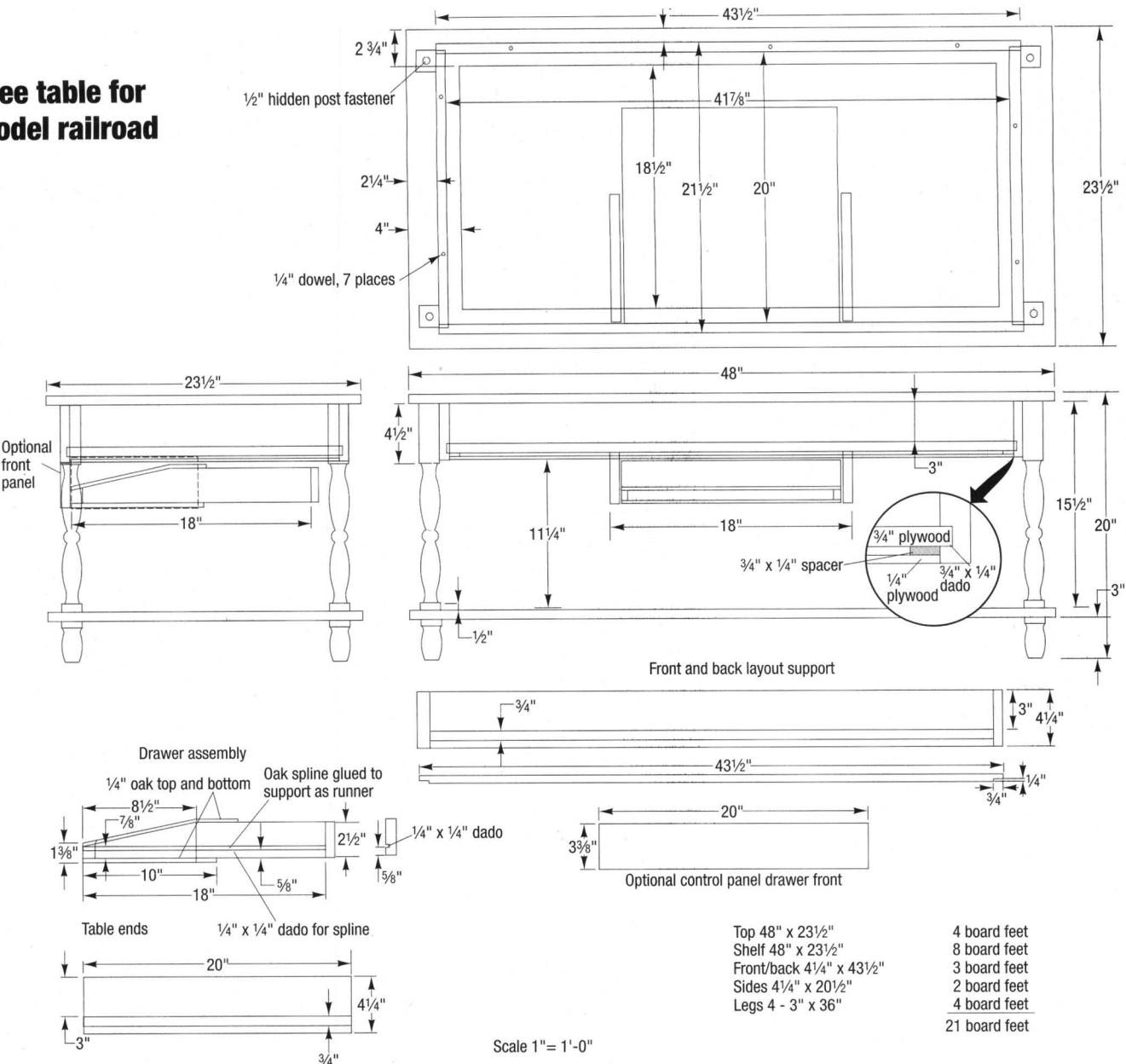
Tabletop and shelf

I began by edge-gluing pieces of oak lumber to make the $23\frac{1}{2}'' \times 48''$ lower shelf. For this step, the edges of the boards must be perfectly straight and square, so I used a jointer, which fin-

ishes the edge in a few passes. Note that I made the shelf a little oversized, so I could cut it to final size later.

After the boards were straight and square, I glued them together with aliphatic resin (yellow) glue held under pressure with bar clamps. Some builders may want to add biscuits to reinforce to these long joints. Be sure that the finished shelf is perfectly flat.

Coffee table for a model railroad



The top consists of two long boards and a pair of end panels made up of short boards running parallel to the long sides. I made the end panels by edge-gluing short lengths of lumber to make a single 11" x 18" piece with the grain parallel to the short edge.

After the glue had cured overnight, I carefully cut the piece in half lengthwise to make two 5" x 18" panels. These are oversized, but like the shelf, I made the top larger so I could trim it to exact size later.

The long side boards of the tabletop are 2 3/4" x 48". Again, I made them oversized to allow for final trimming. I then glued the end pieces to the long boards, making sure that the opening for the glass top is exactly 18" x 40". After the glue had dried, I cut the top and shelf to their final 23 1/2" x 48" size.

Table legs

I made the legs in **fig. 1** by gluing together matching 3/4" x 1 1/2" x 16" pieces of oak to make rough 1 1/2" square blanks. My glued pieces were slightly larger than 1 1/2" square, so I planed the legs to size and cut them to their final length of 15 1/2". I also made the short 3" legs in the same manner.

You can leave the legs square for a more-modern look, but I turned mine to match the details in our existing furniture. If you do turn the legs, cut notches into the corners where the square section meets the turned area. These cuts keep the turning chisel from gouging the square corners.

Table assembly

The layout base is a piece of 3/4" oak plywood that slides into a slot cut in

the ends, front, and back supports. These supports are 4 1/4" wide, and the front and back have 3/4" rabbeted joints at both ends (to create a stepped joint that hides most of the end grain at each corner). All of the supports have a 3/4" dado (or square-edged groove), cut 1/2" up from the bottom, that the layout drawer slides into.

I glued the layout side supports to the back. Next, I positioned this support assembly on the underside of the top and fastened it in place with glue and 1/4" dowels, three in the back and two on each side. I clamped all of these joints tight and allowed them to dry.

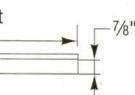
The joints between the legs and the shelf and top are reinforced with 3/8" dowels. The added strength helps these joints withstand side pressure if the table is dragged across a carpet.

Drawn for Model Railroader magazine by
STEPHEN F. ANDERSON

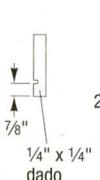
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Angle to fit control panel top

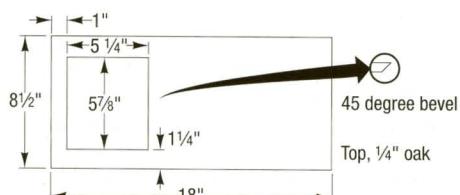
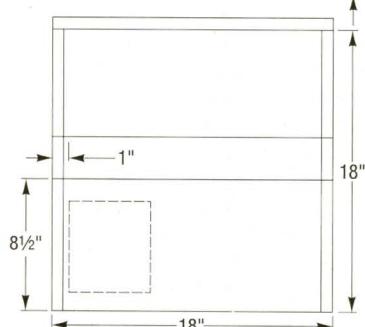
Control panel front



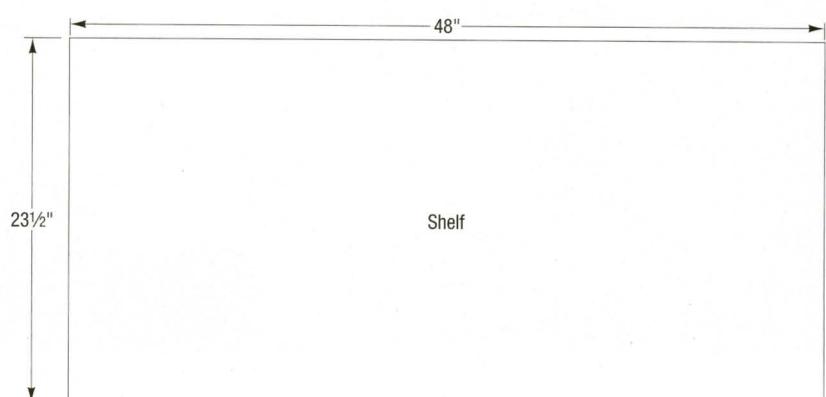
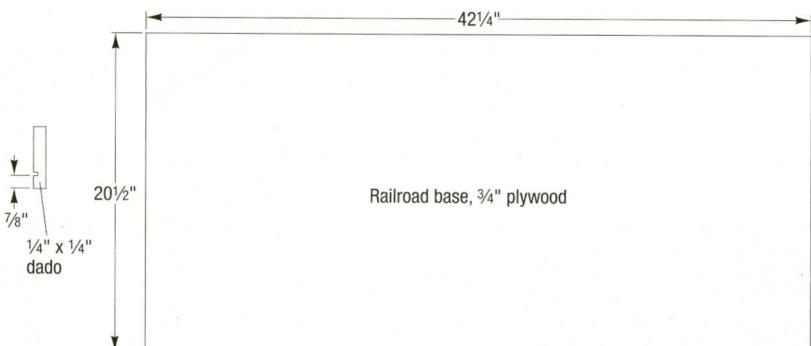
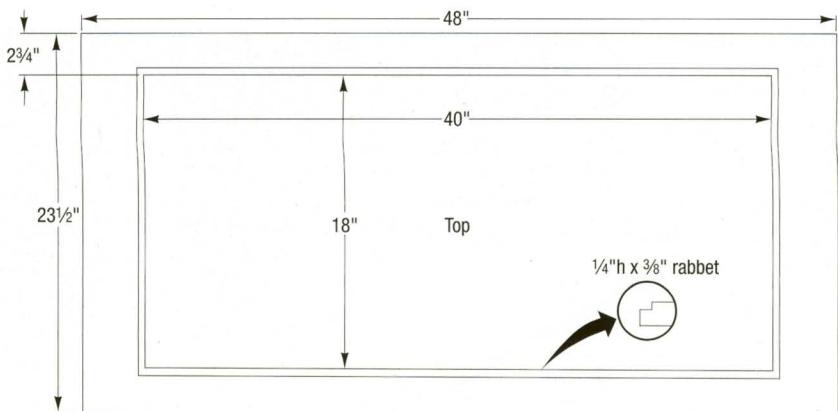
Drawer support



2 1/2"
4"
9 1/2"
18"



Scale 1" = 1'-0"



I built my layout on a piece of $3/4"$ oak plywood, since it's more dimensionally stable than solid wood. The layout base slides into place so I can remove it from the table. See **fig. 2**.

The wiring is concealed in a $1/4"$ space I made by gluing $1/4" \times 3/4"$ strips to the underside of the layout base. I was careful to keep the perimeter strips and glue clear of the sliding surfaces. Then I covered the wiring area with a piece of $1/4"$ plywood attached with screws.

Finally, I positioned and glued the table front to the sliding layout base, making sure the front was aligned to slip tightly between the end supports. Once the glue dries, the base should slide easily into the dados on the ends and back supports, and the front edge should fit flush against the end supports and behind the table legs.



Fig. 3 Control panel. The power pack and sloping control panel are built into a small drawer. A drop-down oak front helps conceal the control panel.

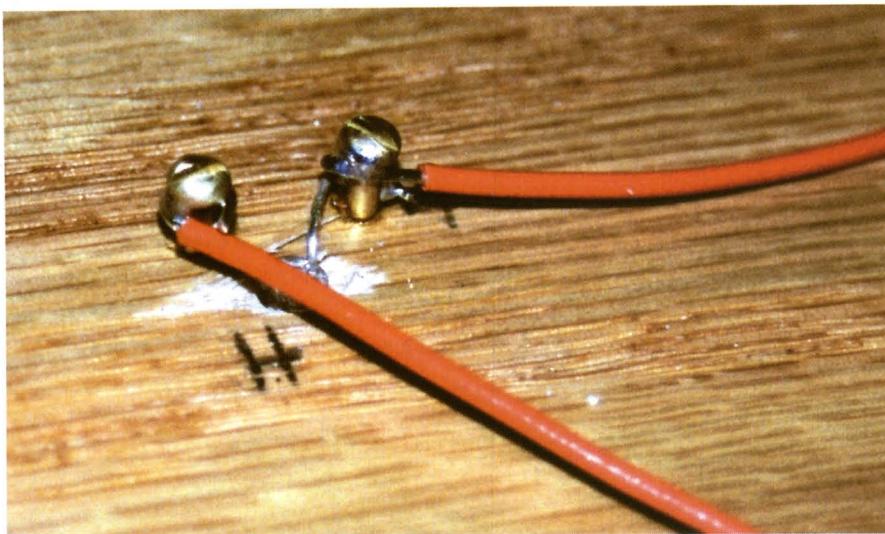


Fig. 4 Wire terminals. Small brass screws are driven into the layout base under each feeder location. They serve as soldering terminals to anchor the one end of the flexible wiring between the layout and the movable control panel.



Fig. 5 Concealed wiring. The layout wiring fits within this recessed area that will be covered later by a piece of $\frac{1}{4}$ " plywood attached with small screws.

I attached metal furniture glides to the bottom of each leg so the table would slide easier on the carpet. Finally, I used a router to cut a $\frac{1}{4}$ " x $\frac{3}{8}$ " rabbet around the opening in the top and squared the corners with a sharp chisel so the glass top would fit properly.

Control panel drawer

The control panel is built into a drawer underneath the layout, **fig. 3**. This panel has a $\frac{1}{4}$ " solid oak top and bottom with $\frac{3}{4}$ " oak sides. The drawer slides on slotted mounting pieces attached to the layout base with screws.

The panel top and bottom are made of edge-glued pieces of $\frac{1}{4}$ "-thick oak. The front panel is $\frac{1}{4}$ " x $8\frac{1}{2}$ " x 18" with a cutout for the power pack, however this opening and the side angle may have to be adjusted for other brands. The bottom panel is $\frac{1}{4}$ " x 10" x 18".

I made a pair of matching control panel sides from $\frac{3}{4}$ " oak, 18" long and $2\frac{1}{2}$ " wide, cut as shown in the drawings. I cut a $\frac{1}{4}$ "-wide dado, $\frac{1}{4}$ " deep, for the drawer slides on each inner side. I made these dados slightly wider than $\frac{1}{4}$ " so the drawer can slide easily.

The drawer side supports are made from two pieces of $\frac{3}{4}$ " x 4" x $9\frac{1}{2}$ " oak. These supports also received a $\frac{1}{4}$ " dado cut to hold the drawer guides made from $\frac{1}{4}$ " x $\frac{1}{2}$ " x $9\frac{1}{2}$ " oak. The back of the panel drawer is $\frac{3}{4}$ " x $2\frac{1}{2}$ " x 18".

I first glued together and clamped the panel drawer sides, front, and back. After the assembly had dried, I added the bottom, applying more glue. The panel top fits snugly over the power pack and is attached with screws.

The control panel drawer slides into its supports from the rear. I designed this assembly so the back of the panel

LED lighting system

On my layout I used light-emitting diodes (LEDs) instead of bulbs for illumination. LEDs generate less heat but require DC, so I converted my power pack's constant AC accessory output to DC by adding a Radio Shack no. 276-1173 full-wave bridge rectifier.

I connected a pair of wires from the AC terminals on the power pack to input terminals on the rectifier. Then I wired the rectifier's positive (+) and negative (-) terminals to a terminal block in the control panel.

I wired the layout's LEDs in groups of six or seven in series with 470-ohm $\frac{1}{4}$ -watt resistors that came with the LEDs. Each of these diode circuits use about 15-30 milliamperes of current, and each is controlled with a toggle switch.

My white diodes use more current than other colors as their light is a combination of three colors: red, green, and blue. The white LEDs use about .22 watts of current, so I use a $\frac{1}{2}$ watt resistor with them so the resistor doesn't overheat. – Stephen Anderson

hits the drawer slides when it's fully extended. Then I added a drawer front that's hinged to the bottom edge of the drawer and held in its closed position with a small hook and eye, see **fig. 3**. When this drawer front is closed, it conceals the panel and keeps the drawer from sliding too far back.

Finishing

I used three coats of polyurethane varnish on my table, sanding it between coats with 320-grit sandpaper. To get a really smooth finish, sand the final coat with 600- or 1000-grit sandpaper and apply a coat of furniture wax.

I took the completed table to a glass shop to have a piece of $\frac{1}{4}$ " tempered safety glass cut to fit. A glass shop has the specialized equipment to cut and finish the edges of that size and thickness of glass. I chose safety glass for its strength and the fact that if broken, it shatters into many small fragments, which prevent major injuries.

Track diagram

I painted a white track diagram on the oak control panel, **fig. 3**, and drilled $\frac{1}{4}$ " holes to mount the Miniatronics no. 36-210-04 single-pole single-throw toggles I use as power switches. Then I

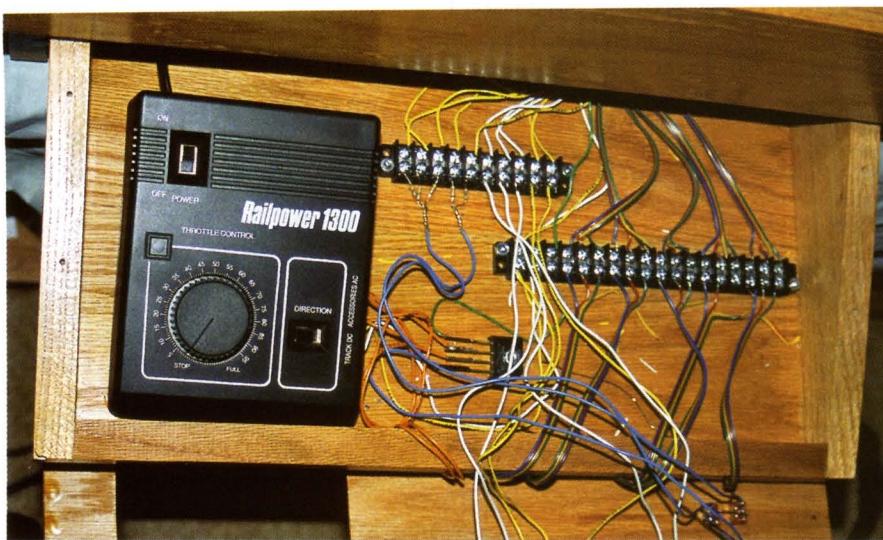
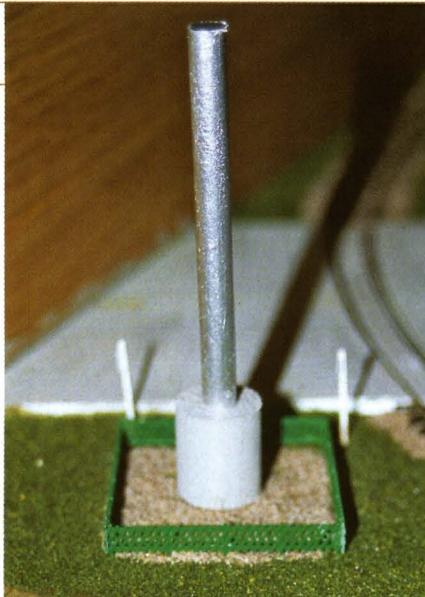


Fig. 6 Panel wiring. All of the control panel's internal wiring uses flexible stranded wire so the panel front can be removed and replaced as needed.

Glass lifting device

Once I had set the glass top into the rabbeted opening in the tabletop, I realized that there was no easy access to the layout. To resolve this problem, I invented this device to lift a corner of the glass. It's camouflaged as an advertising sign base.

I used a piece of $\frac{1}{4}$ " dowel, about 6" long, that fits into a $\frac{9}{32}$ " hole drilled through the layout. Then I added a simulated concrete base to make the pole look like part of a modern billboard. My base is a piece of $\frac{1}{2}$ " dowel, with a $\frac{1}{4}$ " hole drilled through its center, that's glued to the pole so the top of the pole just touches the bottom of the glass top. The $\frac{1}{4}$ " dowel extends about $1\frac{1}{2}$ " below the layout while the base keeps the pole from falling through. Pushing up on the dowel lifts the glass enough so I can get my fingers under the edge. — S.A.



Glass lifter. This simulated sign pole base can be pushed up from beneath the layout to raise a corner of the glass for easy access to the layout.

mounted a row of Atlas turnout controllers across the bottom of the panel and wired them into the layout.

Wiring

With a movable control panel, the wiring must be securely fastened at both ends. I soldered flexible stranded wire to brass screws driven near each feeder connection, as shown in **fig. 4**. Then I added a small screw eye and a cable tie to secure each end of the wires, leaving plenty of slack in a loose Z shape that expands and retracts with the drawer's movement. See **fig. 5**. Each wire runs to a screw terminal block inside the panel as seen in **fig. 6**.

A handsome addition

The new coffee table was a welcome addition that fit right in with our other family room furniture. Completing the table also pushed me out of my armchair modeler status since I wound up building a nice-looking N scale railroad to fill the empty coffee table and give the project a finishing touch. **MR**

Stephen Anderson has been a model railroader since 1959, and he authored MR's eight-part series on scratchbuilding a 4-6-0 in 1997 and 1998. He's a computer test engineer who's married and has two sons. He's also interested in woodworking and playing the piano.

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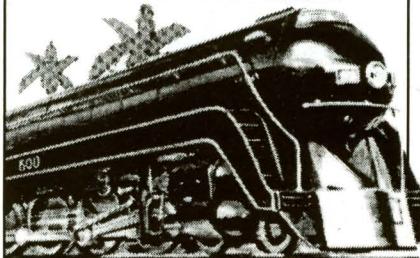
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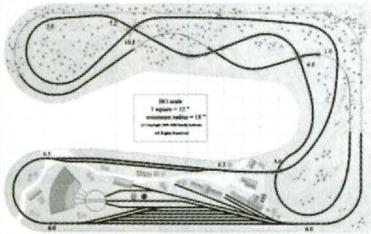
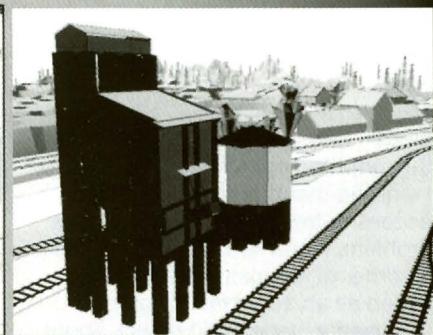
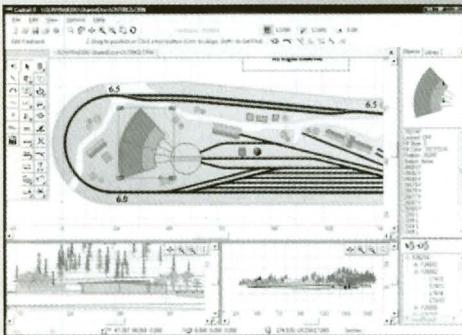
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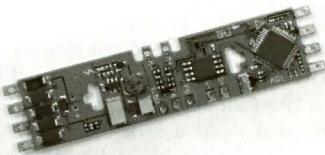
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Building Eureka

Part 2: Adding structures and details to a prize-winning project

By Gerry Leone • Photos by the author

Last month, I wrote about how I planned the town of Eureka for a crescent-shaped space in between the track and the backdrop on one side of a return loop on my HO scale Bona Vista RR. I built the basic scenery, used mock-ups to plan the placement of buildings and a road, and used a front-silvered mirror to make the road look like it extended past the backdrop. With all that done, it was time to turn to structures.

Focal points

In my mind, the cornerstone structure of Eureka would be one I'd admired in catalogs for years: the Silver Plume Bakery by Banta Modelworks. I turned this laser-cut wood kit into Frank's Hardware Store, named for my late dad, as seen in **fig. 1**. I detailed the interior because the model would be



An elderly couple sits on a bench outside Mahlon's General Merchandise and watches some kids at the soda machine outside Frank's Hardware. The scene is the heart of Eureka, a town Gerry Leone added to his HO scale layout, winning *Model Railroader's* Build A Scene Contest.

positioned just inches from the layout's main entry aisle.

Across the street would be Mahlon's General Store, made from Benson's Five and Dime by Walthers. It's named for my late father-in-law. Because this structure would also be close to the aisle, I knew I had to give it a little extra character, so I first airbrushed all the walls Polly Scale CP Gray to represent weathered wood. When that had dried, I lightly drybrushed on a mixture of Polly Scale White, Roof Brown, and Yellow.



Fig. 1 Frank's Hardware. Built from a Banta Modelworks kit and named for Gerry's father, this store is front and center in Eureka, and would get a lot of attention. Therefore, Gerry gave it a full interior, including figures of shoppers.



Fig. 2 Mahlon's General Merchandise. This building started out as a Benson's Five and Dime kit from Walthers. Like Frank's, Mahlon's would occupy a prominent location in the town, so Gerry repainted it and gave it a variety of interior displays, window treatments, and details.

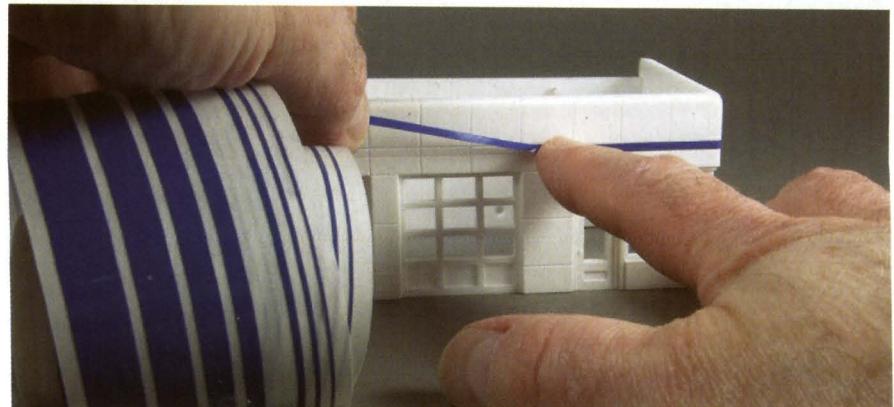


Fig. 3 Pure gas station. To give the gas station a clean, newly built look, Gerry used Pactra trim tape made for auto and airplane models to add crisp blue striping to the City Classics kit.



Fig. 4 Eureka depot. This station was scratchbuilt in the late '70s for Gerry's former layout. He repainted it in the official Bona Vista RR colors.



Fig. 5 Eureka Auto & Engine Repair. With the addition of custom decals, a Walthers State Line Farm Supply kit became Eureka Auto & Engine Repair.

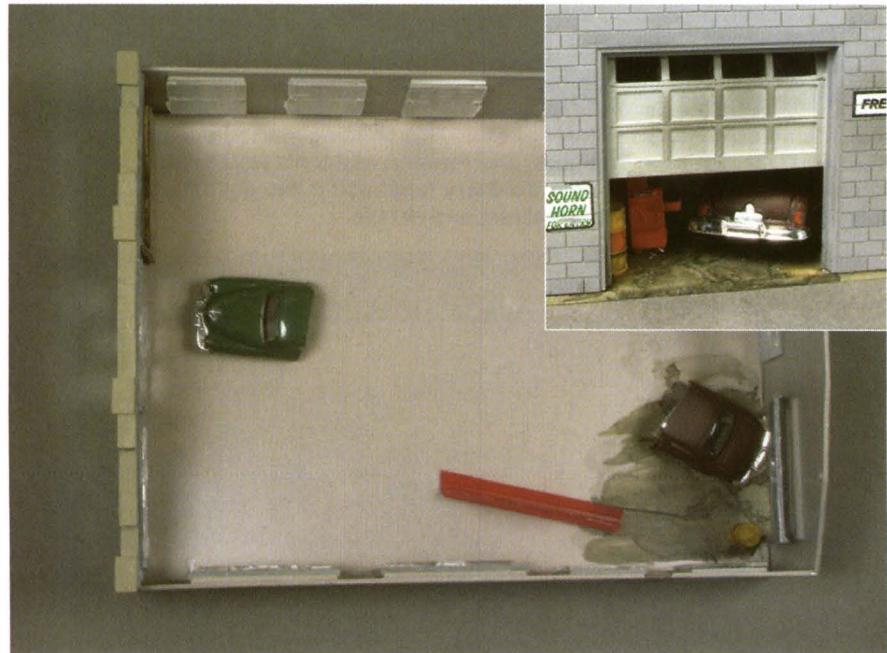


Fig. 6 Interior details. To make the repair shop look occupied, Gerry cut a SceneMaster car in half, painted the back a different color, and glued the pieces where they could be seen through the front and back doors (see inset).

► Materials List

Banta Modelworks
BSC-2081 Silver Plume Bakery

Bar Mills Scale Model Works
32 The 1-Kit

City Classics
108 1930s Crafton Avenue
Service Station

Design Preservation Models
11600 Carr's Parts

Scenic Express
214 SuperTrees

Wm. K. Walthers
933-3613 Benson's Five & Dime
933-2912 State Line Farm Supply

Woodland Scenics
238 Rocky's Tavern

Miscellaneous
Figures from Preiser and Woodland Scenics
Scrap box details and junk piles
Stripwood
Vehicles from Classic Metal Works, SceneMaster, and Woodland Scenics

Finally, to add more of a scratch-built appearance, I rebuilt the stairway railings and supports from stripwood, and detailed the windows with figures, window shades, and curtains (made with a technique outlined in my September 2007 *Model Railroader* article, "Easy window treatments"). See **fig. 2** on the previous page for the results.

City Classics makes a terrific 1950s gas station, and I knew one would look right at home in this town. I wanted to make sure the building looked relatively new, since my layout is set in 1953. So I used some Pactra Trim Tape for the blue stripe across the top of the station, as seen in **fig. 3**. The station's bright white walls, which are intended to simulate enameled steel, would create another focal point for the town.

The town's little passenger station had stood on my '70s layout, painted yellow. After painting it in the Bona Vista's colors, the station got a new life as the Eureka depot, as seen in **fig. 4**.

Next, I swiped a model from elsewhere on my layout, Carr's Parts from Design Preservation Models, and gave it a permanent home in Eureka. Woodland Scenics' Rocky's Tavern also found a home in this tiny burg.

Rebuilding the auto shop

In the foreground of the town, I wanted a building that was short but rather massive to give the town a bit of a frame along the layout's edge.

I selected Walthers' State Line Farm Supply. I liked the idea of turning this into a repurposed building, so I named it Eureka Auto & Engine Repair, seen in **fig. 5**. I boarded up one of the front windows and bent one of the garage doors to look like it was slightly open.

To keep this cinder block building from appearing too uniform and flat, I first airbrushed it with CP Gray, then mixed a small amount of CP Gray with a drop of Grimy Black and painted a few individual cinder blocks. It's important that the secondary color is only slightly darker than the main color, or the building will look polka-dotted.

To give the structure some interesting interior detail, I sliced a blue Scenic-Master automobile in half, painted the back half maroon, and mounted the pieces inside where they'd be visible through the front and rear doors, as shown in **fig. 6**. I added a 55-gallon drum and a JL Innovative Design rolling toolbox for effect. I also glued a nondescript red-plastic cutout near the side windows to give viewers the idea something was inside if they happened to see it in the right light.

Downtown heritage

At this point, all the buildings were in place, except one. To fill in the narrow space between the mirror and the filling station, I picked up a Bar Mills "1-Kit," a design-it-yourself structure kit containing laser-cut walls and windows. I assembled it to make Ray's Custom Cabinets, seen in **fig. 7**.

To give the building a run-down look, I stained the wood with a mixture of India ink and alcohol, then drybrushed CP Gray over that, creating a highly weathered, "peeled paint" effect.

Using an Alps printer, which can print in white ink, I made a decal for the Eureka Livery Company. I applied that to the side of the building, then drybrushed it the same color as the siding. This gives the impression that the sign has faded and all but peeled away.

I also created the sign for Ray's on my computer. I sized it to partly cover the livery company sign. A run-down porch and some rusting roof details made the building look like it has stood in that spot since the 19th century.

Finishing the scenery

To keep the photo backdrop from looking too flat, I added some pieces of Scenic Express SuperTrees behind the

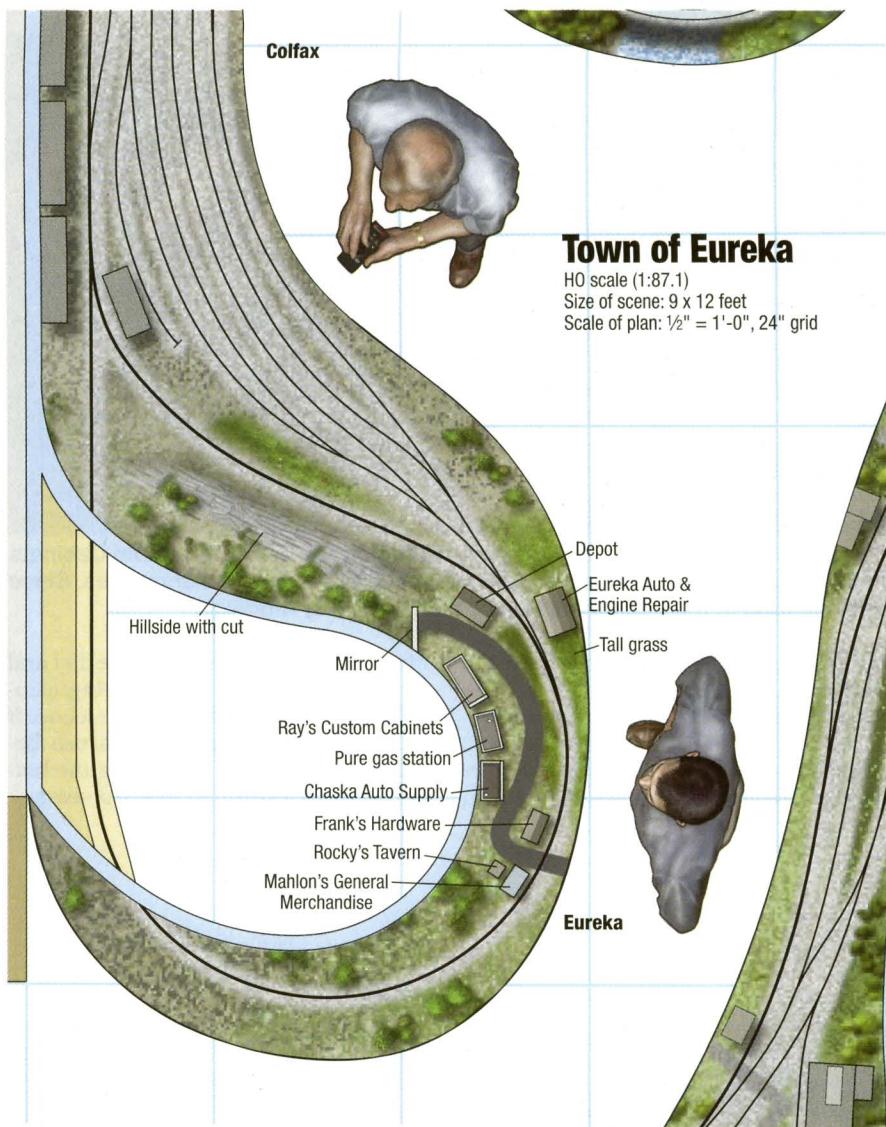


Illustration by Rick Johnson and Theo Cobb



Fig. 7 Ray's Custom Cabinets. Built from a Bar Mills Scale Model Works 1-Kit, Ray's shows its age. A collapsing porch roof and a faded sign for a previous occupant give the building – and the town – the look of history.



Fig. 8 Backdrop treetops. Clothespins resting on top of Ray's Custom Cabinets hold treetops in place while the glue securing them to the backdrop dries. Since only the tops of the trees would show, that's all Gerry modeled.

buildings, gluing them directly to the backdrop itself, as seen in **fig. 8**. Why model tree trunks that won't be seen?

An old salt shaker is a great scenery spreader, so I used that to sprinkle dirt around the structures' foundations to

hide any gaps. After wetting the dirt and some ground foam with rubbing alcohol, I used diluted white glue to secure it all. I also added more underbrush between the buildings and along the bottom of the backdrop to hide the seam.

The last step in building the town is always my favorite: adding little details and figures of people. Cinder blocks, trash cans, fire hydrants, park benches, small twigs, guard rails, signs, dogs, you name it. These things help make any scene look "lived in" and resemble the real world around us. See **fig. 9** for an example.

Of course, people (by Woodland Scenics and Preiser) talking, walking, sitting, working, and playing are what give it life. Then I went one step further by creating "story scenes" – like the old couple in front of Mahlon's who are resting from their dog walk and watching the kids across the street enjoy a summertime soda pop. These scenes give emotional depth to the town.

Just like that, the newest town on my layout became the oldest. And the elusive riddle of what to do with the inside of my return loop was solved in a flash... eureka! **MR**

Gerry Leone, of Excelsior, Minn., is creative director at an ad agency in Minneapolis. His Bona Vista RR was featured in Great Model Railroads 2008.

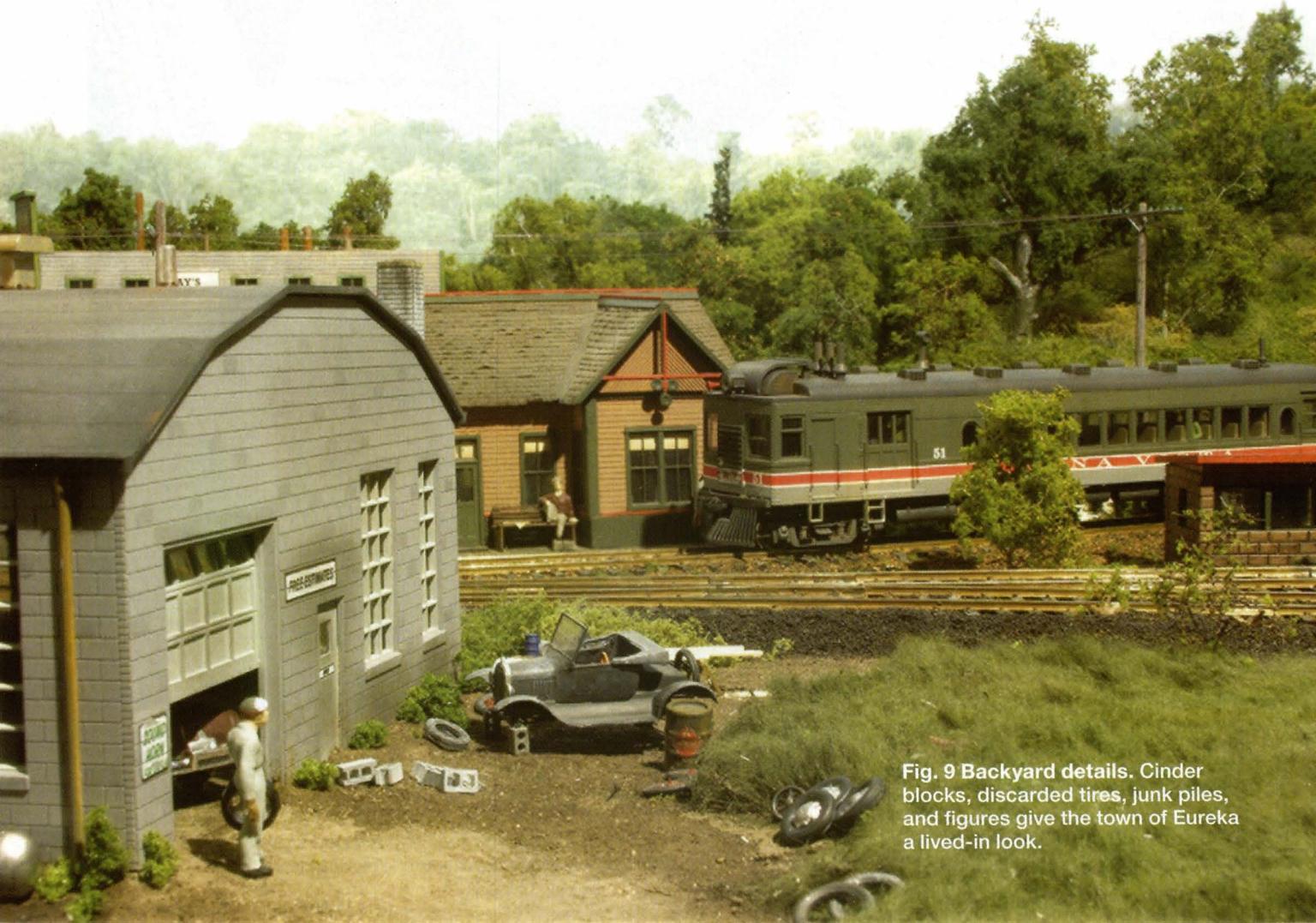


Fig. 9 Backyard details. Cinder blocks, discarded tires, junk piles, and figures give the town of Eureka a lived-in look.

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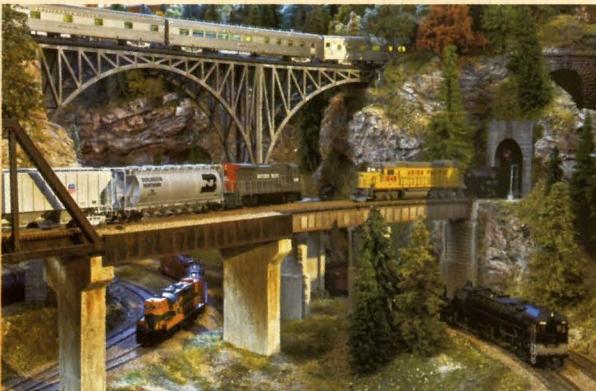
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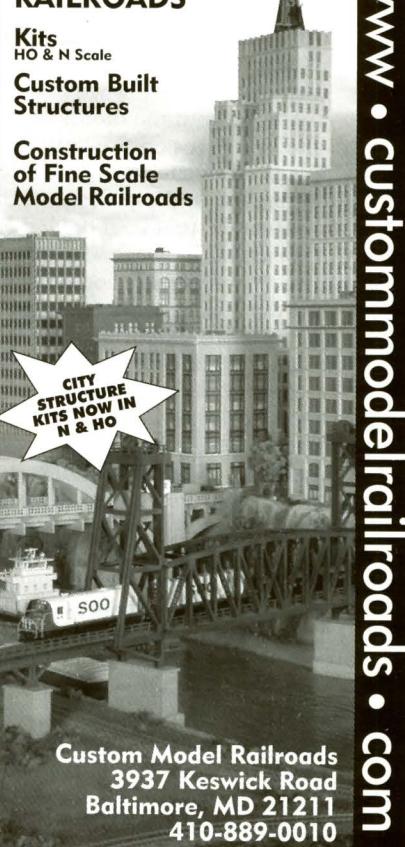
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Installing decoders in older Atlas engines



If you're like me, you probably have at least a few direct-current locomotives in your collection. But what if you've made the switch to Digital Command Control (DCC)? In most cases, you can add decoders to them. This month, I'll show you how I installed decoders in two Atlas HO scale models from the 1980s: an Alco RS-1 with a Kato drive, while the Electro-Motive Division FP7 has a Roco motor.

Alco RS-1 installation. The RS-1 shown originally had a plastic light board that used a 12V bulb and plastic light pipes with integral headlights. There were two brass contacts from the motor that touched wires on the light board. Leads from each truck were also connected to these wires.

The tabs that held the light board in place have the same spacing as those on modern locomotives, so any drop-in decoder for Atlas locomotives will fit in place of the original light board. I used the Train Control Systems (TCS) A6X decoder because it has back electro-motive-force (EMF) control and an onboard regulator for 1.5V headlights.

I cut the wires from the trucks at the light board. Then I carefully removed the board so I wouldn't damage the motor contacts. Isolating the motor isn't necessary as it's separate from the metal frame.

I positioned the motor contacts so the body shell could still be attached without the contacts touching the flywheels. Then I soldered orange and gray wires, connecting the motor's contacts to the decoder as shown at right.

This month, Mike Polsgrove writes about installing Digital Command Control decoders into Atlas HO scale locomotives from the 1980s. The Alco RS-1 (left) uses a Kato drive, while the Electro-Motive Division FP7 has a Roco motor.

Next, I tested the locomotive on my programming track by reading back CV1. Its value should be 3. The programming track has limited current and shouldn't damage an improperly wired decoder. It also tests the motor connection because the motor is used to pulse current from the DCC command station during the read-back process. If you can't read back CV1, check the track and motor connections.

Headlights. I'd intended to remove and cut down the light pipes and use 1.5V bulbs for the front and rear headlights. However, when I looked through my light bulb

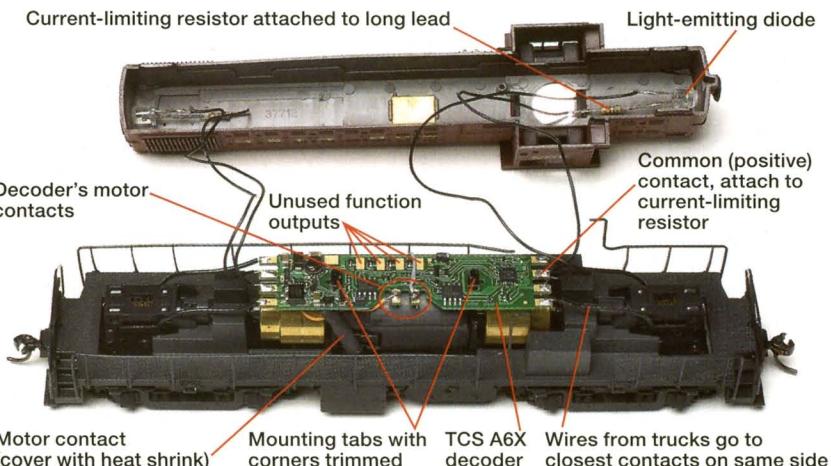
drawer, I came across some 5 mm Yeloglo White light-emitting diodes (LEDs) from Miniatronics (model 12-510-10). I used an electric drill as a lathe to reduce the size of the LED lens to fit into the hole.

I started by trimming the both leads on the diode so I could fit the LED into the drill chuck. Keep the long lead longer, as this identifies the anode, or positive, side on these LEDs. I then used a small flat file to turn the lens, checking the fit often.

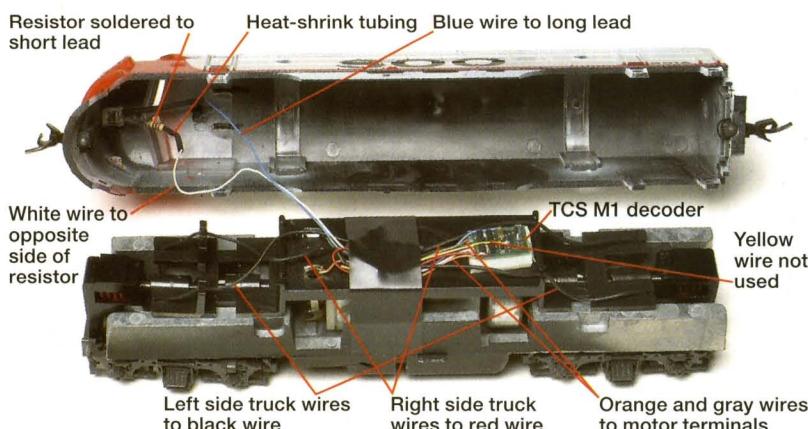
Function outputs. There are four function outputs, two on each end of the decoder, for the headlights. I wired the headlights as shown in the photo. If I'd reversed these connections, no harm would have been done to the LED or the decoder. The headlight simply wouldn't have worked.

Next, I tested the lights by putting the locomotive on the main line and turning on the headlights. When I selected function F0, the front headlight illuminated when the throttle was set to forward. (Keep in mind that the long hood is forward in most first generation Alco road switchers.) The rear headlight should come on in reverse. Once I was satisfied that the headlights worked, I attached the diodes to the locomotive shell with full-strength white glue.

If your locomotive runs in reverse when the throttle is set to



Mike used a Train Control Systems (TCS) A6X decoder in this Atlas RS-1 with a Kato mechanism. The decoder has back electro-motive-force (EMF) control and an onboard regulator for 1.5V headlights.



This FP7 has a Roco mechanism without a light board, so Mike used a Train Control Systems M1 decoder. The compact two-function wired decoder is easy to install and also features back EMF control.

forward, there are two ways to fix it. Option one is to add the value 1 to the value already programmed into CV29. Option two is to reverse the orange and gray wires on the motor terminals of the decoder.

Auto-reversing headlights. Since I don't care for auto-reversing headlights, I remapped the decoder functions. The front headlight now comes on in both directions when F0 is activated and the rear headlight comes on in both directions when F1 is activated. I accomplished this by consulting the TCS "Programming Advanced 'X' Features," available online at the TCS Web site (www.tcsdcc.com).

Chart 19 shows that if the value of 3 is programmed into CV33, the front headlight will be activated in both directions and the value of 4 programmed into CV34 makes F1 control the rear headlight. Further, I programmed CV49 and CV50 with a value of 40 so each headlight is dimmable using F4. I programmed CV64 to a value of 5 to set the brightness of the dimmed headlight.

Electro-Motive Division FP7. The Atlas FP7 didn't include a light board. Instead, the Roco drive had two wires that conducted track power from the trucks to the motor and a 12V bulb. I installed the TCS M1 decoder in this model. It's a small, two-function wired decoder with back EMF control.

To install the decoder, I first disconnected all the wires from

the motor terminals. Then I soldered the truck wires to the decoder, right side to the red wire and left side to the black.

It doesn't matter which side the red and black wires are connected to unless you plan to operate the locomotive on a direct-current layout. If the locomotive runs in the opposite way you expect, correct it using either of the methods recommended for the RS-1.

The original headlight was attached to the frame near the front of the locomotive. I replaced it using the same techniques as on the RS-1. Before installing the LED, I soldered a current-limiting resistor to the short lead, the decoder's white wire to the other side of the resistor, and the decoder's blue wire to the long lead. If the headlight doesn't work, reverse the blue and white wires.

I programmed the headlight to be on in both directions and dimmable by setting CV49 to 40. I set CV64 to 5 to set the brightness when dimmed.

Installing decoders in older locomotives isn't hard, it just requires some patience. Take your time and follow the manufacturer's instructions. Before you know it, your old direct-current models will be ready for service in the DCC age. **MR**

Send your questions about Digital Command Control to DCC Corner, *Model Railroader* magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail dcc@mrmag.com. We regret we can't answer all the questions we receive.

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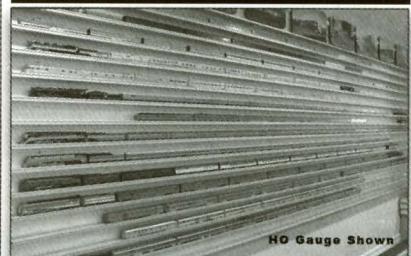
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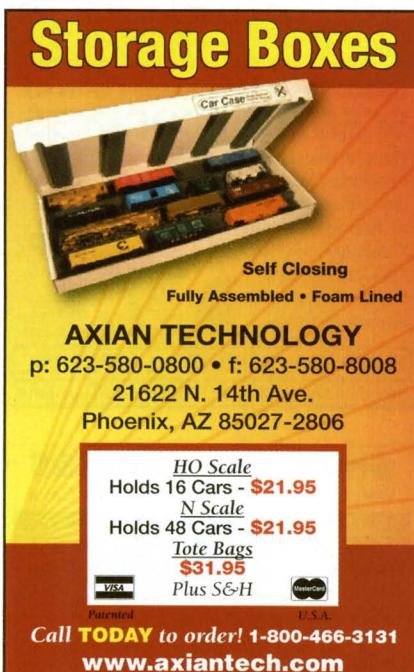
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11 all new track plans

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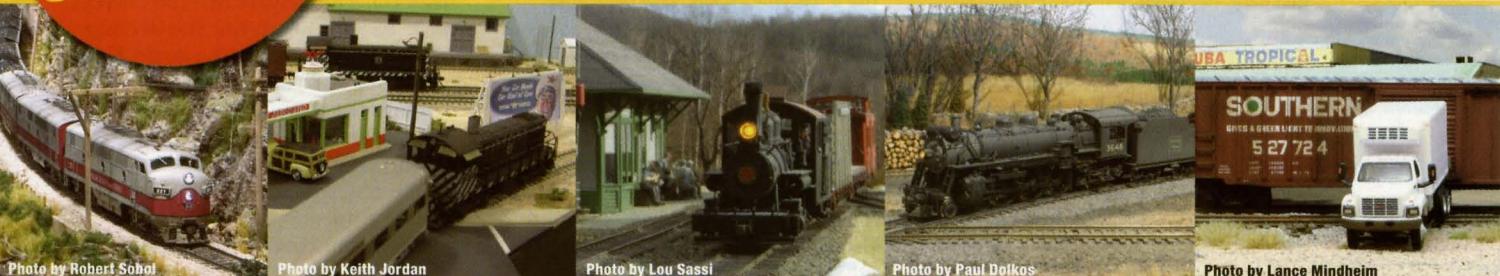
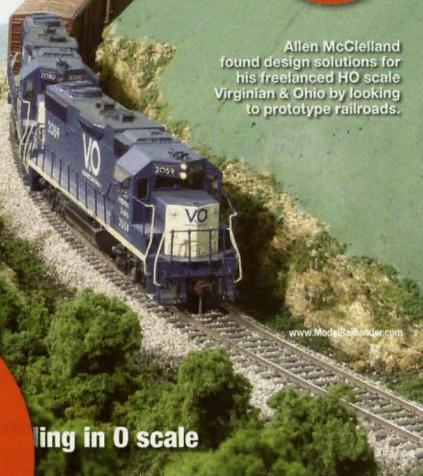


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- Learn how to build accurate track arrangements for any model railroad
- Tips on building layout modules now while planning for the future

Product Reviews



HO scale “Hippo” is an accurate model of a long-serving Pennsy standard steamer

Models of the Pennsylvania RR's powerful class I1sa Decapod-type locomotives have just been introduced by Broadway Limited Imports. They're offered in a number of versions that capture the look and feel of PRR's standard motive power design. The models include automatic dual-mode sound decoders that operate on Digital Command Control (DCC) or DC layouts, or as DC-only locomotives.

Standard power. In the early 20th century, the PRR developed a large stable of standardized motive power. The 2-10-0 I1s Decapod was one of five types that also included the E6 4-4-2 Atlantic, K4 4-6-2 Pacific, L1 2-8-2 Mikado, and the M1 4-8-2 Mountain. Once the PRR had a design it liked, the company built or

bought its locomotives by the hundreds, often over an extended period of time.

The first I1s Decapod came along just before World War I. (The “s” designated that the locomotives were superheater equipped.) The company's Juniata Shop built 122 Decapods in 1918 and 1919. They were followed by orders for 475 more built by Baldwin in 1922 and 1923. In the 1930s, the majority were rebuilt for improved tractive effort to become class I1sa engines.

The Pennsy's Decapods were among the largest of their type, weighing in at 386,100 pounds. With their 96,000-pound tractive effort, each I1sa was the equivalent of two class H8 2-8-0s on heavy drags. Their huge boilers and massive siderods soon earned the locomo-

tives the nickname “Hippos.” These hard-riding engines weren't built for speed, but the pulling power of double- or triple-headed “Hippos” was well known.

Construction. The model closely matches prototype drawings of an I1s published in *The Model Railroader Cyclopedic: Vol. I Steam Locomotives*, (Kalmbach Publishing Co.). The drivers are the correct scale 62" diameter, but the driving wheelbase is stretched a scale 3" for clearance between the flanges.

Only the middle driver set is blind. This is contrary to the PRR prototype, which had flanges only on the end drivers. However, the flanges and sideplay in the inner drivers keeps the model's wheels on the rails so it can operate on curves as sharp as an amazing 18" radius. Of course, the model looks far more realistic on wider radius curves.

A pair of exploded isometric drawings are included and show how the engine and tender are assembled. The boiler is attached to the frame with a single screw hidden under the cylinders and two smaller screws beneath the cab.

The model follows the established design Broadway Limited used on its earlier PRR steam locomotives. It has a plastic boiler and tender body and both have numerous separately-applied details. The long class 210-F-82B

► Reviewed in this issue

86 Athearn N scale EMD FP45 diesel

88 Atlas HO scale 1932 ARA boxcar

90 Zimo Electronik MX31ZL DCC system

92 MR “Quick looks” Piko large scale track Kato HO Superliners



The small “doghouse” on the tender was for the train's head brakeman.

► HO scale PRR I1sa 2-10-0

Price: \$399.99 with QSI dual-mode sound decoder; \$299.99 DC only

Manufacturer:

Broadway Limited Imports, LLC & Precision Craft Models, Inc.

4 Signal Ave.

Ormond Beach, FL 32174

www.broadway-limited.com

Versions offered (all PRR)

- PRR I1sa, 2-10-0 Decapods are offered in six versions with the class 210-F-82A eight-axle large tender, modern headlight, and with or without the QSI Quantum dual mode sound decoder.
- PRR I1sa, 2-10-0 Decapods are also made in a dozen versions that include the original class 90-F-82 short tender, modern or original headlight, and with or without the QSI Quantum dual mode decoder and sound system.

tender and modernized front end details mark our sample as a late version. Other earlier versions are also offered as is the original small class 90-F-82 tender.

A can motor with a flywheel drives the third pair of drivers through a worm and worm gear. Cast metal rods transfer the motion to the remaining drivers. The cast-metal boiler weight and metal frame provide heft for traction.

Electronics. A QSI Quantum control and sound system is hidden in the tender. This system operates on conventional DC and on Digital Command Control (DCC) systems. The sound system's manual volume control is under the tender water hatch on the fireman's side, and the twin downward-facing speakers are mounted on the die-cast metal tender frame.

► More on our Web site

Current subscribers can see and hear the BLI PRR I1sa in action. Watch the exclusive video on our Web site at www.ModelRailroader.com.

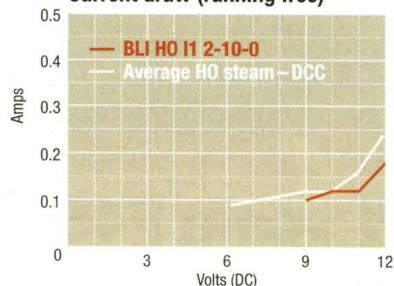
► HO PRR I1sa features

Dual-mode DCC sound decoder
Cab interior with backhead
Constant directional headlight and backup light
Drawbar pull: 4.9 ounces (with traction tires)
Engine and tender weight: 25 ounces, engine alone is 15 ounces
Five-pole can motor with turned brass flywheel
Length with long tender, 14 1/4"
Lighted number boards
Magnetic knuckle couplers (at correct height)
Minimum radius: 18"
RP-25 contour wheels (in gauge)

Drawbar pull (ounces)



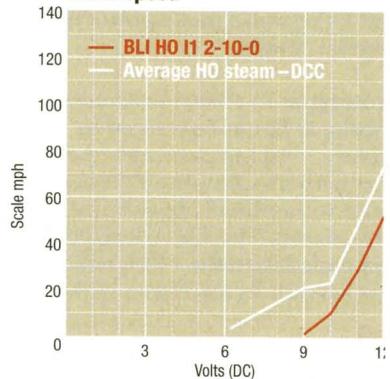
Current draw (running free)



	Draw when slipping	Draw when stalled
BLI HO I1 2-10-0	.30A	1.00A
Average HO steam+DCC	.33A	.67A

"Average" data based on comparable locomotives reviewed recently

Scale speed



Minimum sustained speed
BLI HO I1 2-10-0
Average HO steam+DCC

BLI HO I1 2-10-0	Average HO steam+DCC
1.4 mph	3.5 mph

jumper wire on the right side of the circuit board. To get into the tender, use a small screwdriver to gently pry the tender shell off the frame. With the power off, disconnect the black jumper wire, apply power for at least 10 seconds, and the system will reset and provide an audio confirmation. Then plug in the jumper and it's ready to go.

Whichever tender is used, this well-done Decapod will fit right into any layout representing the Pennsy's steam-to-diesel transition era. Some of these rugged freight haulers served until the end of PRR steam in 1957. — Jim Hediger, senior editor

Performance. We tested our sample I1sa with traction tires on the rear drivers (a set of plain drivers are also included). On DC, the sound started at about 5 volts, but it took 9 volts to get the locomotive moving at a scale 1.4 mph. At 12 volts, it reached 51.9 mph, and developed a drawbar pull equivalent to 68 free-rolling cars on straight and level track.

This model's QSI dual-mode control system offers numerous programming adjustments that will change its operating characteristics and sounds. A 53-page instruction manual and two addenda explain these adjustments in detail.

If you want to return to the factory settings, there's a reset



N scale F45 and FP45 have plenty of power to pull passenger or freight trains

The semi-streamlined successor to Atchison, Topeka & Santa Fe warbonnet-clad F units, Electro-Motive Division FP45s served briefly in passenger service but had long freight-hauling careers, as did the F45. The Athearn N scale FP45 and F45 feature many prototype-specific details.

Prototype. In 1966, the Atchison, Topeka & Santa Fe wanted to replace its aging passenger diesel fleet with a locomotive that had a more streamlined appearance than a hood unit. The EMD designers responded with the FP45, which was essentially an SDP45 with a

cowl body. Milwaukee Road also used FP45s to haul its *Hiawathas*.

In 1968 Electro-Motive introduced the F45, which was a freight version of the FP45. The F45 was nearly identical to the FP45 except that it didn't have a steam generator, and it was therefore five feet shorter than the FP45.

All the Athearn model's dimensions match drawings in the *Model Railroader Encyclopedia vol. 2: Diesel Locomotives* (Kalmbach Publishing Co., out of print).

Appearance. The model is built primarily of plastic and the quality of the molding is excellent. Rivet seams and other details match prototype photos. The separately applied front handrails are made of flexible acetal plastic and have thin scale profiles. The rooftop fans are especially well done, with separate

fan blades under see-through grills. The etched-metal side intake grills are also see-through.

One detail missed on the N scale FP45 model was the split fuel/water tank. There should be a noticeable seam that divides the tank. The fuel tank is correct for an F45.

The FP45 and F45 are available with or without dynamic brakes (denoted by two forward fans on the roof). Other roadname-specific details include horn placement, round or square cab windows, snowplow or streamlined pilot, and flush or hinged number boards.

The passenger warbonnet paint scheme on our review sample matches prototype photos. Along the bottom sill, the "F" and "FUEL" stencils are legible under magnification. Although unreadable, EMD builder's plates are also printed on each sill under the cab.

Cab handrails are molded into the body shell. The stirrup steps are separately applied.

Under the hood. After removing the front and rear couplers I lifted off the body shell. The motor and two brass flywheels are encased in a split die-cast metal frame.

A printed-circuit board is mounted on top of the motor. Two light-emitting diodes (LEDs) are mounted on each end of the board.

Athearn also sells a Digital Command Control-and-sound-equipped version of the model.

Performance. The headlight of the DC model we tested came on at just

► N scale FP45 and F45

Price: \$99.98 (DC), \$229.98 (DCC and sound)

Manufacturer

Athearn Trains

1550 Glenn Curtiss St.
Carson, CA 90746

www.athearn.com

Road names: (multiple numbers available) FP45: Atchison, Topeka & Santa Fe (passenger warbonnet); ATSF (freight scheme); Milwaukee Road (orange scheme and yellow and gray scheme); undecorated. F45: ATSF (freight scheme); Burlington Northern; Great Northern (Big Sky Blue); Montana Rail Link; New York, Susquehanna & Western; undecorated

► FP45 and F45 features

All-wheel drive and electrical pickup
Digital Command Control sound decoder (DCC version only)
Drawbar pull: 1.12 ounces
Five-pole skew-wound motor with dual brass flywheels
McHenry magnetic knuckle couplers (at correct height)
Metal RP-25 contour wheels mounted in gauge
Minimum radius: 9 3/4"
Prototype-specific details
Weight: 6 ounces

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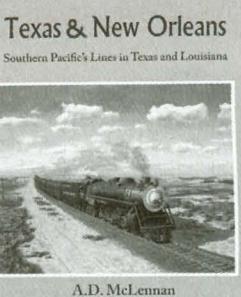
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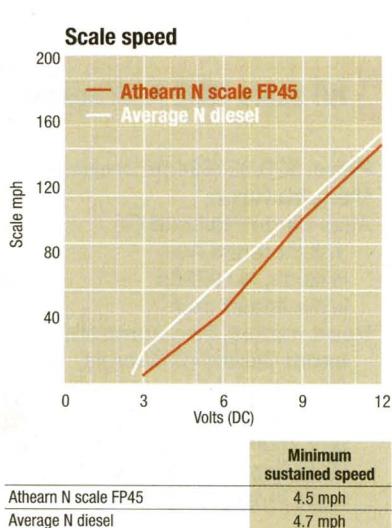
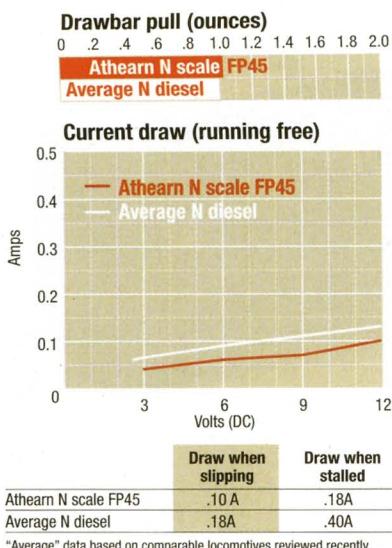
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under 3 volts. As I advanced the throttle to 3 volts, the FP45 moved steadily at 4.5 scale mph and accelerated to 145.3 scale mph at 12 volts. Depending upon its gear ratio, a prototype FP45 had a top speed of 102 mph. (The F45 had a top speed of 83 mph).

The model ran smoothly through a 9 3/4" curve, but looks better on curves of 11" or greater.

The Athearn FP45 has an impressive 1.12 ounce drawbar pull, which is equivalent to 27 N scale freight cars or 13 N scale passenger cars on straight and level track.

This N scale diesel is a smooth-performing model that accurately depicts its cowl-covered prototype.
— Dana Kawala, associate editor

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1932 ARA boxcar in HO depicts a historic prototype

You might think there are few significant freight cars that haven't been represented by HO plastic models. That assumption is a little closer to being true because of this convincing Atlas model of the American Railway Association (ARA) standard boxcar of 1932.

In 1932, the ARA, the predecessor of the Association of American Railroads (AAR), adopted a standard design for a steel boxcar. The new car could be from 3,500 to 5,000 pounds lighter than cars of previous designs. A total of 14,784 boxcars were built to the 1932 ARA standard design.

The standard allowed purchasers to specify many components, so numerous small differences could be found. Ted Cullotta's book, *The American Railway Association Standard Boxcar of 1932* (Speedwitch Media), details the features of each owner's cars.

The Atlas models are accurate within fractions of an inch. They're made with an injection-molded plastic body on a die-cast metal floor. A plastic underframe includes AB brake rigging and piping.

Two body styles are offered to represent the variety of specifications within the standard. Style 1,

as seen here on the Maine Central car, has square-cornered Dreadnaught ends and a rectangular-panel Murphy steel roof. Warrior River Terminal is the only road name released on a style 2 body, with flat plate ends and a flat, riveted-seam roof.

Most of the safety appliances and other body details are free-standing parts added by the manufacturer. Two versions of Youngstown corrugated-steel doors and three makes of hand-brake wheels are used on either body style as appropriate. The detailing includes molded plastic uncoupling levers, but the retainer valve that should cap the brake cylinder exhaust pipe next to the hand brake on each car is omitted.

Our review samples have the same cast-sideframe trucks, so they don't represent the variations in trucks specified by different owners. Also, the trucks of the WRT prototypes were on centers 6" farther apart than the ARA standard, and this isn't represented on the model. One wheelset on each car was tight in gauge. This was corrected by removing the truck and twisting the wheels outward on the plastic axle.

► HO scale 1932 ARA boxcar

Price: \$29.95 (\$24.95 undec.)

Manufacturer:

Atlas Model Railroad Co.

378 Florence Ave.

Hillside, NJ 07205

www.atlasrr.com

Road names, two numbers

each: Central of Georgia, Clinchfield, Missouri Pacific (International & Great Northern), Maine Central, Warrior River Terminal; also undecorated in two body styles

► HO 1932 boxcar features

Body-mounted Accumate magnetic knuckle couplers at correct height

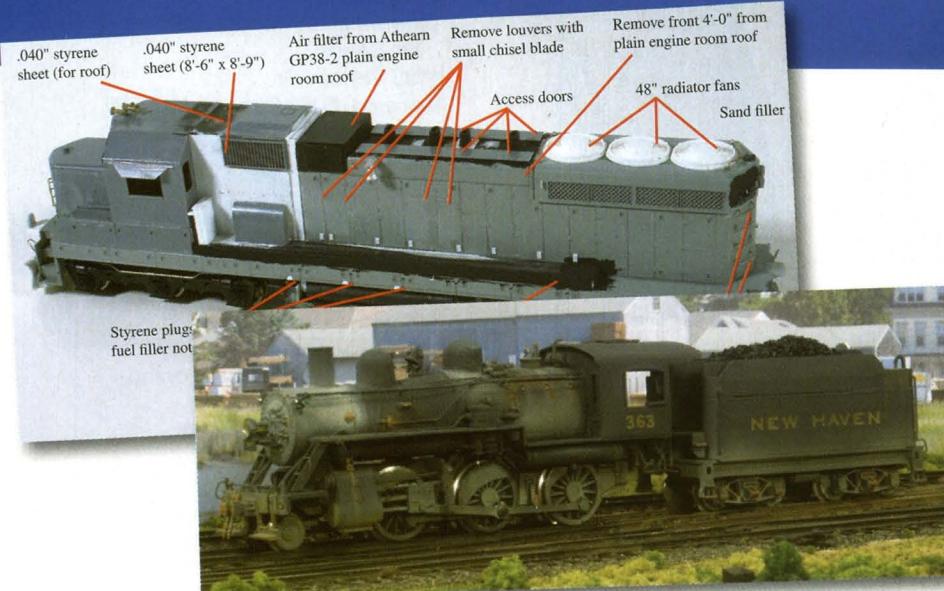
Metal RP-25 contour wheels

Prototype-appropriate body styles and details

Weight: 4 ounces, 1/4 ounce more than National Model Railroad Association RP-20.1

The ARA boxcars were long-lived and led directly to the standard boxcar designs of the 1940s and 1950s. It's good to have this Atlas model of a historic car from the steam-to-diesel transition era. — *Andy Sperandeo, executive editor*

Enter Model Railroader's locomotive kitbashing contest!



Show us a locomotive that you have modified to match a particular prototype – steam, diesel, or electric-type in any scale – and you can win one of three prizes!

First Prize: \$1,000 • Second Prize: \$500 • Third Prize: \$300
In addition, payments for the article will be made at our standard per-page rate.

Rules:

1. A kitbashed locomotive is described as a model steam, diesel, or electric-type locomotive that has been modified through the addition, removal, or alteration of its external parts to create a more accurate representation of a prototype locomotive. Typical modifications include replacement or alteration of the cab, boiler or hood, end platforms, headlight placement, tender, and running gear or trucks, plus the addition of detail parts such as bells, horns, railings, and more. The parts can come from other locomotives or from specialty manufacturers, and can be altered as needed. Smaller elements of your locomotive project can be scratchbuilt if an appropriate part is not available. The degree to which a locomotive is modified is up to you.

2. Entries can be in any scale from Z scale through large scale (G scale).

3. The locomotive must operate and be able to pull a train on appropriate scale track.

4. Your submission must include:

A. An article of 1,500 to 2,500 words describing your inspiration for the kitbashing project and the techniques you used to modify your locomotive. Include a list of parts, paint, decals, and other materials used in your project. Manufacturers' part numbers and the manufacturer/source of the parts are required. One computer printout of the article (or a typed copy) is required. Include an electronic version of your text on a CD if possible.

B. Six to 12 publishable photos of the locomotive before and after modification taken at different angles while on a layout, diorama, or section of track with an appropriate

backdrop. Photos must have good depth of field (foreground and background are in focus). All photos should be original and can be slides, prints, color transparencies, or digital. Prints must be glossy and 5 x 7 inches or larger. Digital images must be submitted on CD in RAW (preferred) or TIFF formats with a resolution of at least 300 dpi at 8 x 10 inches. JPEG format images of 300 dpi or greater will be accepted, but JPEG files do not produce publishable images of the same quality as RAW or TIFF files. Computer printouts (do not need to be photo-quality) of all digital images are required to allow the contest judges to review each submission. Do not submit images via e-mail.

C. Publishable photos of the kitbashing project while under construction, especially close-up photos showing the key elements described in your text.

D. A photo of the prototype locomotive your kitbashed model represents.

E. Captions for all photos, including details or techniques being illustrated.

F. Drawings (if appropriate) to provide helpful information to a reader trying to duplicate your project. Neat pencil sketches are acceptable as well as computer-generated drawings. All illustrations will be reformatted by *Model Railroader*'s staff to fit the magazine's style should your story be published.

G. A brief biography and photo of yourself.

5. Articles must be written and submitted by the entrant. You are not required to take your own photos, but you are responsible for compensating the photographer and securing all copyrights to the photos.

6. Each contestant is limited to one entry.

7. All entries must be received in *Model Railroader*'s offices no later than June 1, 2009.

8. Winning entries will be published beginning in late autumn, 2009. The first-prize winner is awarded \$1,000, second-prize winner is awarded \$500, and third-prize winner is awarded \$300. In addition, winning entrants will be paid for their kitbashing stories at our standard publishing rates.

9. All winning entries become the property of *Model Railroader* magazine.

10. *Model Railroader* reserves the right to purchase any non-winning entries at our standard rate for future publication.

11. Non-winning entries not selected for purchase will be returned only if appropriate packaging and postage are supplied by the entrant at time of submission.

12. Kalmbach Publishing Co. employees and members of their immediate families are not eligible to enter this contest.

13. Judging will be conducted by the *Model Railroader* staff.

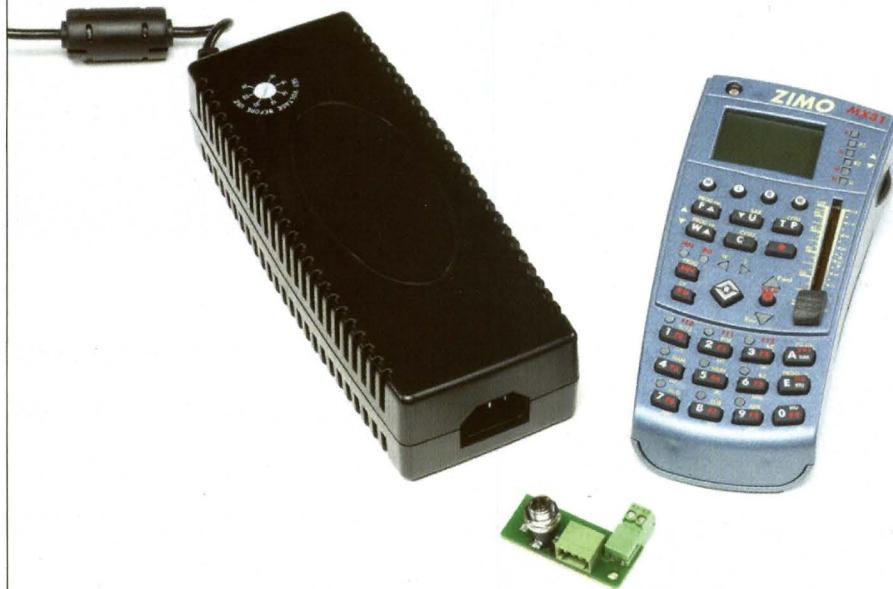
14. *Model Railroader* reserves the right to not award all prizes and to withdraw any awards.

Mail entries to:

Model Railroader magazine
Locomotive Kitbashing contest
21027 Crossroads Circle
P.O. Box 1612
Waukesha, WI 53187-1612

Entry deadline: June 1, 2009

**Model
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MAGAZINE



Digital Command Control starter set is easy to use

While this Digital Command

Control (DCC) starter set is easy enough for a novice to set up and operate, the Zimo MX31ZL also has a wide array of advanced programming features and operating capabilities that would satisfy expert DCC users.

Getting started. I set up the Zimo MX31ZL DCC system and was running trains in about five minutes. The connection panel includes a barrel jack for the power supply, a four-pin socket for the four-wire cable that connects to the cab, and a pair of screw terminals for the track leads. Unfortunately there isn't a separate set of terminals for a programming track, which would have made it easier to set up an isolated programming track section.

The connection panel can be mounted on the layout fascia or



The cab has a CAN bus socket (left) and a four-pin socket (right).

► Zimo MX31ZL DCC system

Price: \$590.40

Manufacturer

Zimo Electronik

Distributed by Model Railroad

Solutions

1195 Velrose Dr.

Kelowna, B.C., Canada, V1Z 6R7

www.mrsonline.net

► Zimo MX31ZL features

14, 28, or 128 speed steps

5.5-amp power supply

5-foot cab tether

Accepts up to 10,239 locomotive addresses

Backlit $\frac{7}{8}$ " x $1\frac{1}{8}$ " screen

Cab measures $1\frac{1}{4}$ " x $2\frac{1}{2}$ " x $5\frac{1}{2}$ "

Controls up to six throttles

Control up to 13 DCC functions

Each accessory decoder

address from 1 to 512

controls up to 4 paired

functions or 8 single functions

USB cable and USB memory stick adapter

Variable track voltage (10 to 22 volts)

Works with Zimo wireless radio receiver and cabs

under the benchwork. Since the cab also contains the command station and the booster, it must remain plugged into the panel.

Cab layout. The MX31ZL cab is similar to Zimo's MX31 tethered cab and MX31FU radio cab. The cab's screen is backlit green when running locomotives (LOCO mode), red when operating accessory decoders (SWI mode), and yellow when programming decoders.

In LOCO and SWI modes you can also choose between the EXPERT and OPERATOR display. The OPERATOR display shows the active decoder's address, speed steps, and direction, while the EXPERT mode uses a split screen that shows the OPERATOR mode information with a recall stack of decoder addresses underneath it.

Train speed is controlled by a slider key on the front of the cab and a side-mounted thumbwheel for finer control. By pressing the "RG" key you can divide the increments of the slider key in half. The cab also has a direction button and an emergency stop button.

In LOCO mode you can use various "E-procedures" outlined in the instruction manual. For example, pressing the E key followed by 0 lets you toggle between 14, 28, or 128 speed steps.

You can use the alpha-numeric keypad to assign addresses and give specific names to locomotives or routes on your railroad. These keys are also used to trigger DCC functions and other features of the system. Many of the other keys have multiple functions as outlined in the instruction manual. I found it useful that the menu-driven Zimo system will often prompt you to press a specific key in the display, such as "A" for address or "C" for setting a configuration variable.

You can operate up to 10 locomotives in a consist by selecting each locomotive's address and pressing the "TP" key. All the decoder addresses with a "T" after them on the display will then operate as a single unit. These locomotives will also be saved as a consist in the recall memory stack until you remove them from the consist. For advance consisting and to save multiple consist addresses in the recall memory stack, you'll

need to program configuration variables (CVs) 19, 21, and 22, as long as these CVs are supported by your particular decoder.

DCC programming. The system features an array of programming capabilities, and programming decoders is easy to follow via the menus on the cab display. You negotiate the menus using the thumbwheel and "soft keys" underneath the LCD screen. These keys have different functions depending on the menu that you're in, and the menu options are clearly defined on the screens.

The MX31ZL supports service mode programming, using an isolated programming track, or ops mode programming (programming on the main.) For most decoders, CVs can only be read back in service mode.

Other user-friendly programming menus allow you to program accessory decoders as well as set up and name turnout routes or an operating signal system.

The system also supports RailCom, a bidirectional communication system.

Other features include a fast clock and a track voltage and current draw display.

Upgradeable and expandable.

The Zimo MX31ZL cab has a USB socket on the side of the cab so that the user can download software upgrades to the system from Zimo's Web site using a USB cable or memory stick. (You can also upgrade Zimo decoders from the Web site.)

Zimo refers to the command bus of its systems as the CAN bus. A single jack on the front of the MX31ZL cab lets you connect up to five additional tethered MX31 cabs to the system using extra CAN bus cables and plug panels. You can also add a radio receiver to use Zimo's MX31FU wireless cabs. And, the MX31ZL cab can be used as a tethered cab with other Zimo command stations.

Full of advanced features and easy to upgrade and expand, the Zimo MX31ZL DCC starter set is a good choice for modelers looking for an easy-to-use system with a full menu of features. — *Dana Kawala, associate editor*

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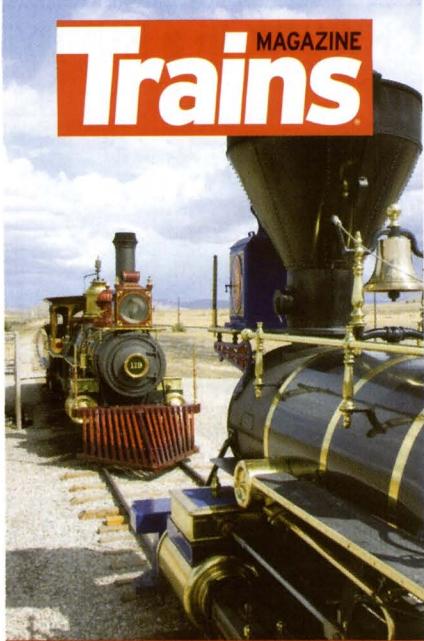


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Product Reviews

► **An MR quick look: Piko large scale track**

Price: \$59.99 (R1 turnout)

Manufacturer

Piko Spielwaren Ltd.

Silvergate Distributors

6444 Nancy Ridge Dr.

San Diego, CA 92121

silvergatedistributors.com

Description: large scale turnout

Comments: Piko's line of G scale track for outdoor or indoor use is new to the market, but it will feel very familiar to fans of large scale trains. The components are all new and include high-quality code 332 brass rails and UV-resistant HDPE plastic.

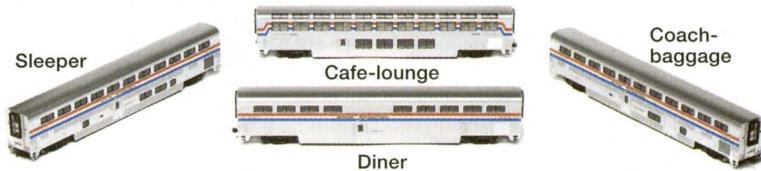
Straight sections are offered in 1200, 600, and both 320 and 280mm lengths, plus some half sections (160 and 140mm) and one "fitter" piece of 95mm to allow double crossovers. Curve radii include 600mm, 921mm (R3), and 1243mm (R5). Track gauge on our sample pieces is right on the money at 45mm except at switch frogs, where it widens slightly to prevent wheels from picking the



frog. Guardrails are spaced at 5mm from the running rails. The R1 switches have 320mm straight sections and spring-loaded points that stay in place until moved via a small lever on either side of the switch. Rail joiners are sturdy brass with tabs to keep them locked to the tie strip, and the code 332 rail mates precisely with LGB rail. The points fit into small reliefs ground into the stock rails. Locomotives and cars passed through the switches smoothly and reliably.

Piko's sturdy new G track is good looking, well made, and the geometry is simple. — *Terry Thompson, publisher*

► **An MR quick look: HO Amtrak Superliner I cars**



Price: Superliner I coach-baggage, diner, and sleeper, \$68 each; cafe-lounge, \$70

Manufacturer

Kato USA, Inc.

100 Remington Rd.

Schaumburg, IL 60173

www.katousa.com

Description

Plastic and metal ready-to-run passenger cars

Comments: Four additional Amtrak Superliner I bi-level passenger cars have been released by Kato USA. These cars are well-detailed, have Amtrak's phase 3 paint scheme of the 1980s, and match the models reviewed in the January 2008 *Model Railroader*.

Like the earlier coach, these new Superliners have interlocking parts that latch together without cement. The cars include interiors, flush-mounted tinted windows, and marker lights. Interior lighting kits are offered separately.

The cars ride on free-rolling trucks with metal RP-25 contour wheelsets (in gauge). The visible bearing caps rotate. Kato Kinematic magnetic knuckle couplers are mounted at the proper height. The cars can operate on curves as sharp as 18" radius.

Each Superliner I weighs 7½ ounces, which is an ounce heavier than the National Model Railroad Association's weight recommendation. — *J.D.H.*



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Trackside Photos





Lyle Beck's HO scale Wisconsin & Michigan RR Lake Michigan Division was last seen in *Model Railroader* in January 1995. Since then, Lyle, of Wausau, Wis., has backdated his layout to 1979. In this photo, Alco C-425 no. 2515 is working the Soo Line interchange at Faithorn Junction, Mich.

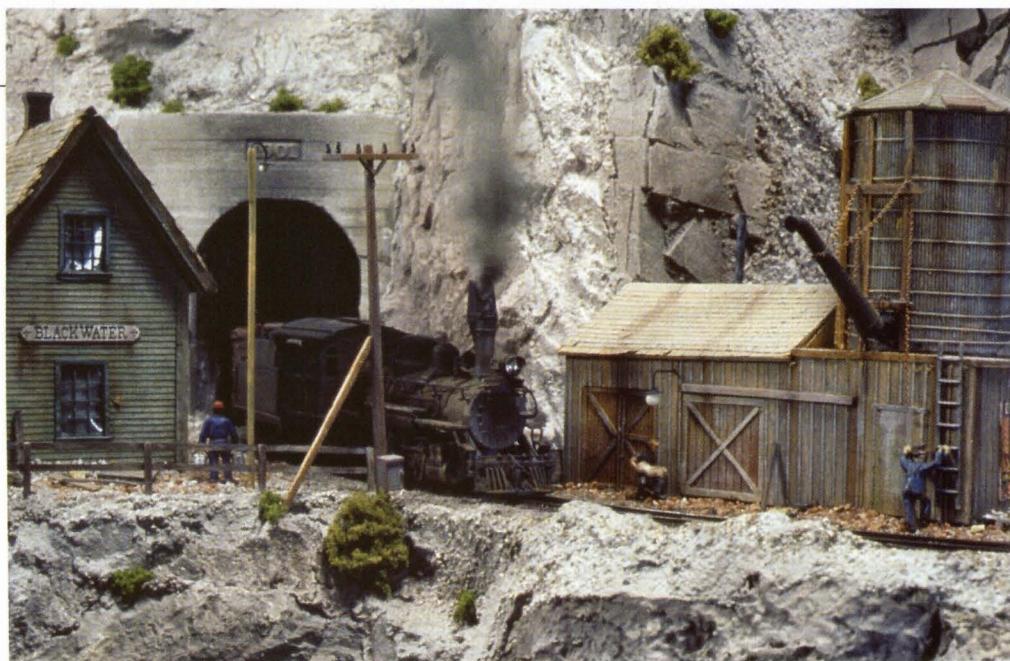
Dave Rickaby photo

The latest motive power can usually be found on the point of the most important trains that run over Mason Cooper's HO scale Norfolk & Western Valley District. On this summer day, class Y6b no. 2200 is making better progress than the motorists on the other side of the valley. Mason, of Stephens City, Va., shot the photo.

Tracksides Photos



A thirsty class C-16 Consolidation pulls into Blackwater for a water stop on the HOn3 portion of Dan Cole's HO scale Pacific RR Co. layout. Dan, of Franklin, Tenn., models logging country in the Pacific Northwest. His 12 x 12-foot layout has standard gauge, HOn3, and HOn2½ track. Dan painted the engine, a Pacific Fast Mail brass import, and also took the photo.





A mix of Alco and Electro-Motive Division power leads the *Lark* across Alegra Canyon on Thanksgiving Day, 1964. Charles Burns of San Luis Obispo, Calif., scratchbuilt the Alegra Canyon trestle, as well as the other bridges on his N scale Southern Pacific Coast Line layout. John Kibildis photo

Nuns watch that the children don't stray too close to the tracks while Staten Island Rapid Transit engine 482 delivers coal to the powerhouse at the Mount Loretto Home for Wayward Children on Staten Island. The 2 x 2-foot HO scale diorama, built by Marc Pitanza of Old Bridge, N.J., is based on a real short line owned by the Baltimore & Ohio. Marc also took the photo.

Want to see your work in Trackside Photos?

Trackside Photos is a showcase for the work of *Model Railroader* readers. We encourage contributions. Send your photos (original color slides or digital images 5 megapixels or better on CD-ROM) to: *Model Railroader*, Trackside Photos, P.O. Box 1612, Waukesha, WI 53187-1612. Include caption information, such as a description of what's going on in the picture; the name, scale, era, and locale of the layout; and information about the rolling stock or structures pictured. For a copy of our photo submission guidelines, contact editorial associate Eric Stelpflug at 262-796-8776, ext. 583, or mrrmag@mrrmag.com.

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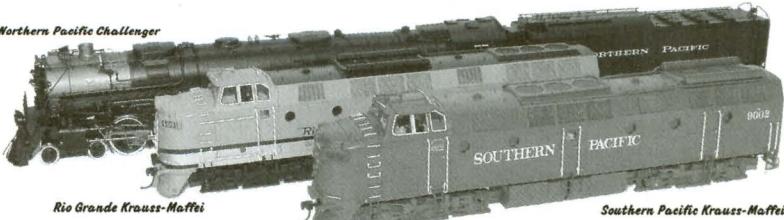
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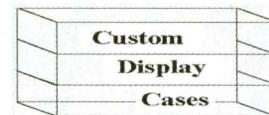
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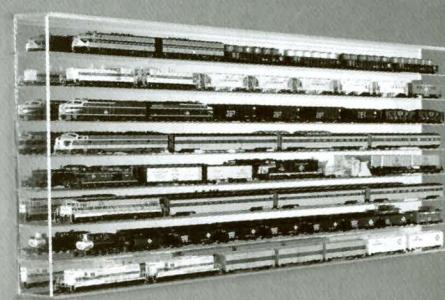
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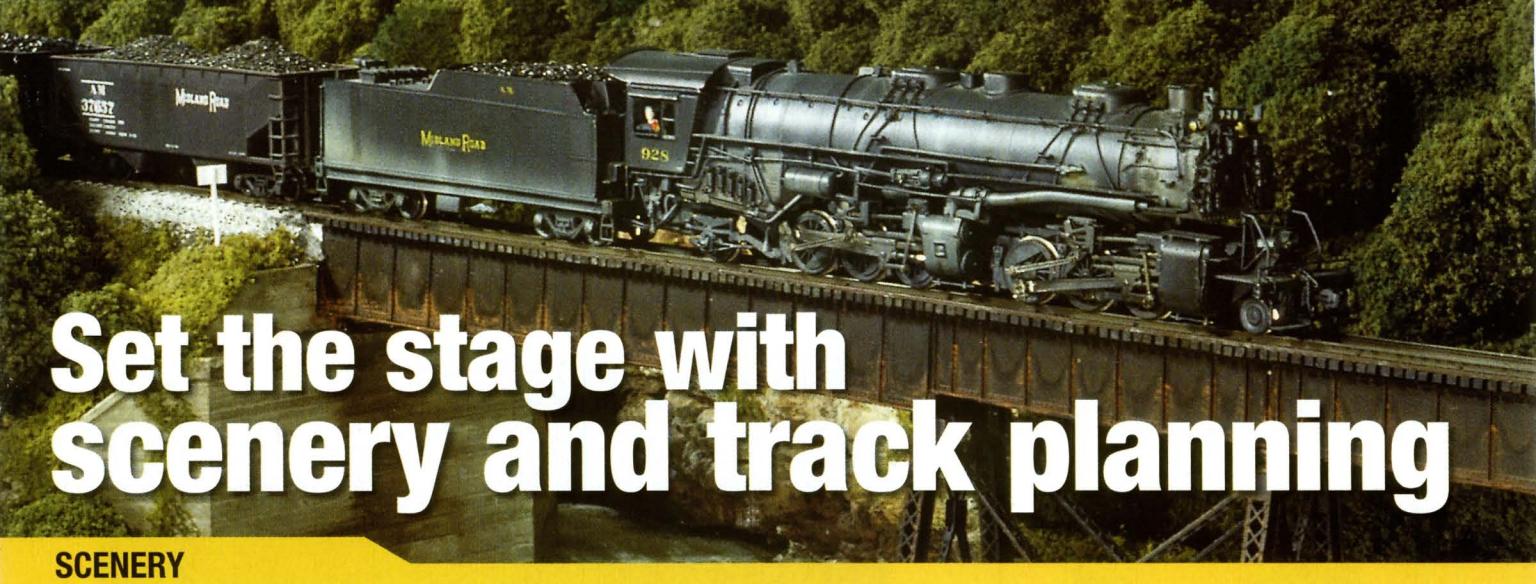
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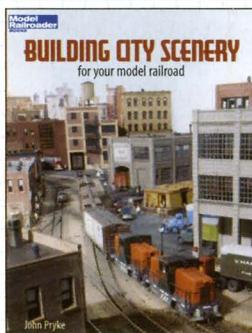
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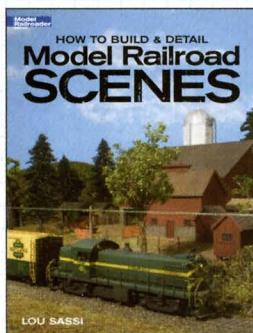


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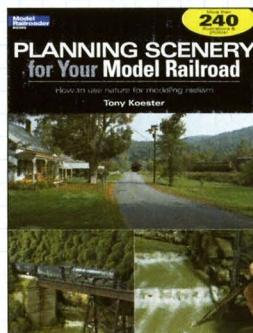
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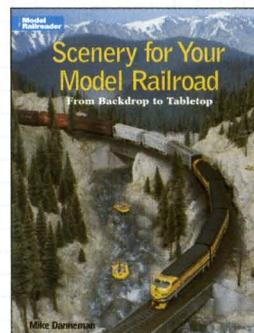
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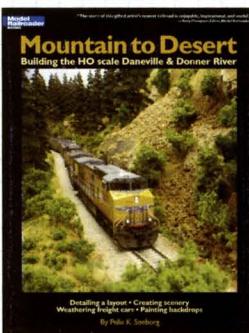
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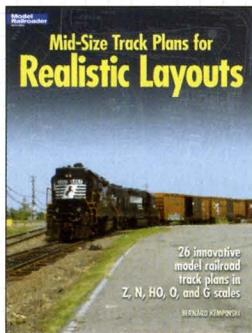


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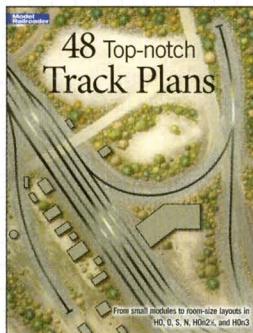


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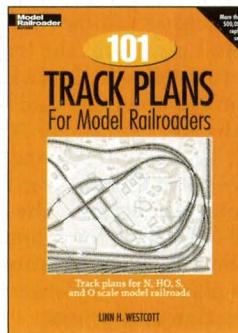
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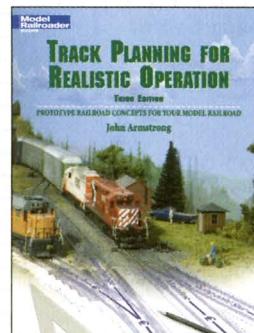
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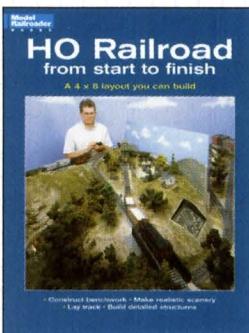
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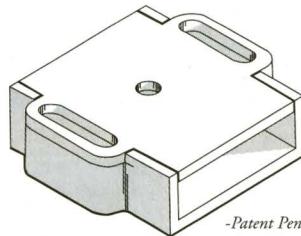
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Trains of Thought

What's in those freight cars?

Tony Koester



Knowing what's supposed to be in a freight car helps determine where it's going. This Wallace W. Abbey photo, taken in the early 1950s, shows workmen unloading boxcars of bulk grain in Milwaukee, Wis.

As my railroad runs through its paces, each train needs to have an identity and purpose. For that to be the case, the cars in each train should represent the type of traffic it would be expected to handle.

On my Allegheny Midland, for example, the Alpha Jets off the Nickel Plate Road (and, later, Norfolk & Western) comprised a lot of cars from the Midwest and West. Conversely, the trains from the Connellsville branch had cars from the Steel City and Northeast. Train 261, the *Florida Perishable*, had blocks of Tropicana orange juice from Florida, and its south-bound counterpart, the *Hotrod*, had auto parts for Atlanta. You could tell one train from another at a glance just by observing its direction and consist.

Now that I'm modeling a specific prototype, I don't have to decide which train hauls what types of traffic. The NKP already figured that out decades ago. My job is to talk to professional railroaders to find out what was what. Train KC-44, for example, which usually ran on No. 90's schedule, was the meat train out of Kansas City. I'd expect to see a lot of meat reefers on that train. Train 66 out of Peoria was known as the "Whiskey" because of traffic from

the Hiram Walker distillery in Peoria. Symbol NS-5, the "Flying Saucer" to St. Louis, usually had a lot of cars off the Erie.

But let's step back a few paces to get a more generalized picture of freight traffic in the 1950s. What types of lading were typically in those boxcars, tank cars and hoppers?

Long-time friend Jim Singer of 5th Avenue Car Shops keeps a sharp eye out for freight-car information, and he recently spotted an Interstate Commerce Commission report titled "Tons of Revenue Freight and Freight Revenue For Each Class 1 Railway By Individual Classes of Commodities, Calendar Year 1954" – the year I'm modeling. He copied the Nickel Plate pages for me.

Even though the following information is correct only for the NKP, it provides a reasonable picture of what was inside freight cars of any Midwestern or Eastern railroad, and it's probably pretty close to what was occurring on the entire North American railroad network.

In 1954, the agricultural commodity that required the highest number of carloads (which is more

important to a modeler than revenue or tonnage) was corn (18,563 carloads), followed by flour (15,221) and wheat (12,794).

Soybeans and soybean products were next in line (8,475 and 9,545, respectively), followed by cereals (3,508), potatoes (6,801), and lettuce (6,103).

In the "animals and products" category, the big winner was fresh meat with 47,153 carloads. Then came cattle and calves (5,611), hides, skins, and pelts (2,572), and swine (2,490).

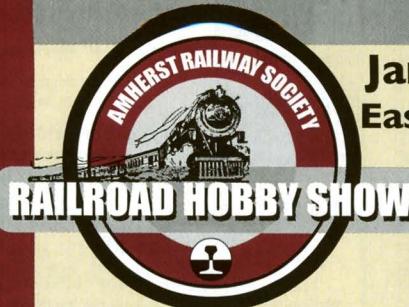
The third group was "products of mines." Not surprisingly, bituminous (soft) coal led with 235,096 carloads. Anthracite loadings were down to 2,394. Coke accounted for 12,973 loads, iron ore 35,144 loads, "products of mines" 12,401, fluxing stone and raw dolomite 7,686 loads, and industrial sand 7,403 carloads.

Group four, "products of forests," was led by lumber, shingles, and lath at 27,426 carloads shipped over the NKP. Veneer, plywood, and built-up wood (whatever that means) were a distant second at 3,083 loads. Box, crate, and cooperage materials ranked third at 1,694 carloads.

The largest category, group five, was "manufactures and miscellaneous." At the head of the pack was manufactured iron and steel with 45,705 carloads. Then came animal and poultry feed (33,370), vehicle parts (28,506), iron and steel pipe and fittings (22,219), chemicals (18,622), scrap iron and steel (18,143), food products in cans and packages (18,006), and sodium (soda) products (17,100).

Petroleum products ranked farther down the list: gasoline with 1,029 carloads, lubricating oils and greases at 3,639, and refined petroleum products at 10,589. Brick and tile, some of which my dad's brickyard in Indiana produced, accounted for 11,443 carloads.

The ICC tables show a remarkable variety of products shipped by rail, much of it in common boxcars, in the 1950s before interstate highways came into play. Knowing what's in our models of these cars helps us set priorities and block our trains accordingly. **MR**



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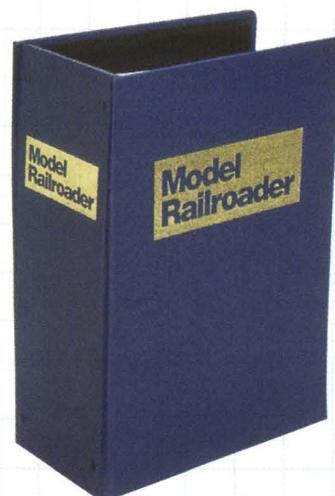
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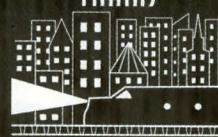
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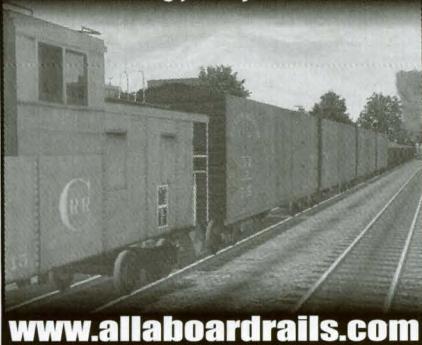
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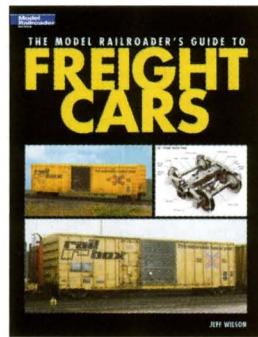
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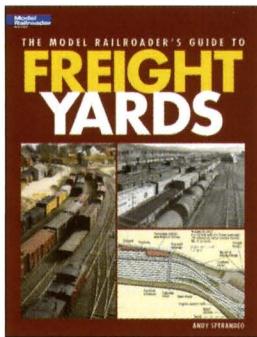
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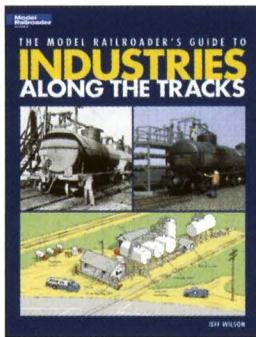
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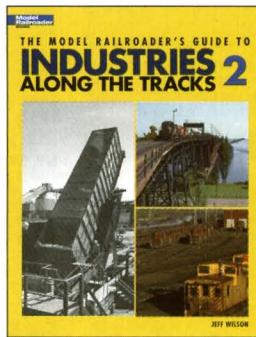
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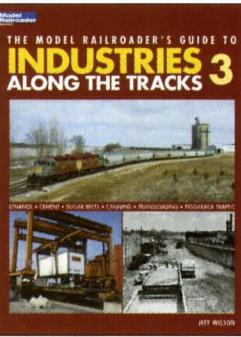
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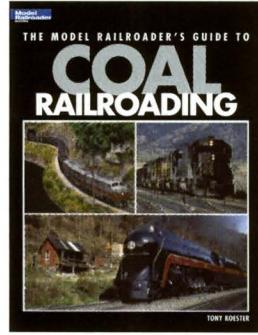
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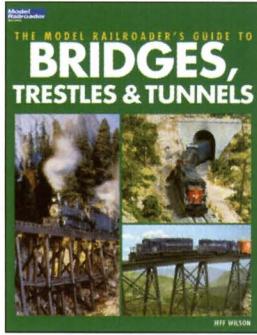
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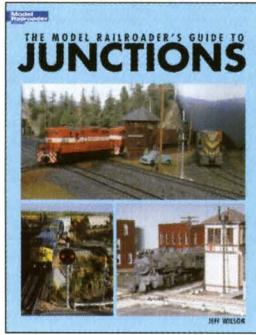
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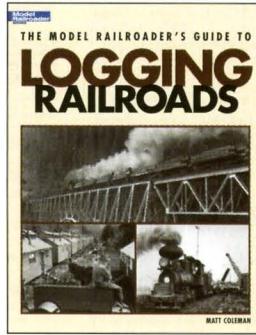
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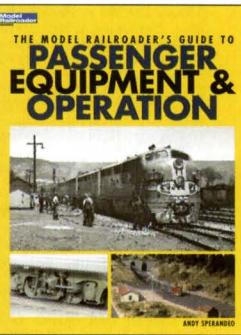
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Schedule of Events

AR, BENTONVILLE: SIXTH ANNUAL GREAT NWA MODEL TRAIN & HISTORICAL MEMORABILIA SHOW Clarion Hotel & Convention Center, 211 SE Walton Blvd. Saturday, February 28, 2009, 9:00am-4:00pm. Admission: \$5.00, children 12/under free. Contact: Bill Wright, PO Box 3113, Bella Vista, AR 72715, 479-426-1544 (cell), Email: w5mth73@cox.net

CO, ESTES PARK: RAILS IN THE ROCKIES XII, Conference Center at Holiday Inn, February 14 (9:00-5:00), February 15 (9:00-4:00). Adults \$5.00, kids under 12 free w/adult. Layouts, exhibits, vendor tables. Sponsors: Estes Valley Division, RMR, NMRA & Mizell Trains, Westminster, CO. Jim Mount, 970-577-1807, jpmount@frii.com

FL, JACKSONVILLE: 31ST JACKSONVILLE RAILFAIR Prime Osborn Convention Center, February 21, 2009 9am to 5pm. Adults \$7 (under 12 free). Operating layouts, over 300 tables, 1000's of model railroad items for sale! Miller, 3106 N. Rochester St., Arlington, VA 22213 (703) 536-2954.

FL, LAKE WALES: HISTORIC LAKE WALES SOCIETY/ LAKE WALES MODEL RAILROAD CLUB 10TH ANNUAL TRAIN SHOW & SWAP MEET. Hardman Recreation Complex, Seminole & 3rd Street, February 7, 2009, 9:00am-4:00pm. Adults \$5, children under 12 free w/adult. Contact Darrell Smith 863-678-4209 or visit our website <http://lwlmrc.org>

FL, STUART: MARTIN COUNTY MR TRAIN & RC SHOW & SALE Martin County Fairground, 2616 Dixie Hwy., Bldg. G, A1A across from Witham Airport, January 17, 2009, 9:00am-3:00pm. Admission: \$5.00 adults; children under 12 free. Free parking. Layout, clinics, door prizes. Information: Al Galli 908-619-1814.

GA, SAVANNAH: 20TH ANNUAL MODEL RAILROAD & TRAIN SHOW National Guard Armory, 1248 Eisenhower Drive, January 17-18th. Saturday 10-5, Sunday 10-4. HO & N layouts, dealer and merchandise displays, food. Admission \$5. Seniors & students \$4. 12 & under FREE. www.coastalrailebuffs.org for more information.

IL, DUPO: THE DUPO TRAIN SHOW. Dupo Community High School Gym, 600 Admiral Trost Drive, Saturday, February 14, 2009, 10:00am-3:00pm. Adults \$3.00, 12 and under free. 19th year! Swap Meet & Layouts. Dirk P. Reynolds, 618-286-3399.

IL, HOPESTON: ECI MODEL RAILROADING 3RD ANNUAL MODEL TRAIN SHOW. Hopeston Civic Center (on IL Rt. 1), February 21-22, Saturday and Sunday 10am-3pm. Displays of G-HO-N scales. Adults: \$2.00; Children 12 & under. FREE. Handicap Accessible. Free Parking. Contact Chad Thomas: 217-304-2718 for more information.

IL, MATTOON: ELEVENTH ANNUAL CROSS COUNTY MODEL RAILROAD DAYS. Cross County Mall, 3/4 mile west on Rt. 16, from exit 190-B, I-57. February 21-22, 2009. Saturday 10:00am-9:00pm and Sunday 12:00pm-5:00pm. Swap meet and numerous running train layouts. Free admission. E-mail john@coryvillestation.com

IN, INDIANAPOLIS: THE INDIANAPOLIS MODEL RAILROAD SHOW AND SWAP MEET Manual High School Gymnasium, Saturday, March 7, 2009, 10:00am-3:00pm. Admission \$5.00, children under 6 free. Naptown & White River Model Railroad Club. Open house during show. Contact: Seven Handy, 317-786-8627, Website: <http://www.naptownrr.org>

IN, NAPPANEE: ELKHART MODEL RAILROAD CLUB ANNUAL SHOW & SALE. Borkholder Dutch Village, 1/2 mile N. of US 6 on Tomahawk Trail (CR101). Saturday, March 14, 2009, 10:00am-3:00pm. Admission \$4.00. Vendor tables, operating layouts, door prizes. Contact Paul Ewing 574-287-0908 or visit www.trainweb.org/ew

MD, ANNAPOLIS: WB&A TOY TRAIN SHOW. Annapolis Armory, 18 Willow Street. February 14, 2009. Admission \$5.00, children under 12 and military free. Tables available for TCA members, train doctor, all scales, parts, new and collectibles. Info: Art Tate, 410-974-0373, annapolismeet@wbachapter.org

MD, ARCADIA: MARYLAND STEAM HISTORICAL SOCIETY THIRD ANNUAL TRAIN SHOW. Show grounds of the Arcadia Fire Co., located 5 miles north Reisterstown, 3 miles south of Hampstead. March 7, 2009, 9:00am-3:00pm. Admission \$3.00 Children under 12 FREE. For more information www.marylandsteam.org Phone: 410-374-1332.

MD, SHARPSBURG: HAGERSTOWN MODEL RAILROAD MUSEUM'S WINTER TRAINFEST - MODEL RAILROAD SHOW. Washington County Agricultural Center, on Rt. 65 south 6.1 miles of the I-70 exit and 4 miles north of Sharpsburg. February 14, 2009, 9:00am-3:00pm, \$4.00. Call Frank 301-824-2239; e-mail: hmrrm@myactv.net

MD, TIMONIUM: GREAT SCALE MODEL TRAIN PLUS HI-RAIL & COLLECTIBLE TRAIN SHOWS. Maryland State Fairgrounds, January 31-February 1, 2009, Saturday 9:00-4:00pm, Sunday 10:00-4:00pm. Adults \$9.00, family \$18.00, under 15 free (good both days). Free parking, 800+ vendors, huge display layouts. Howard Zane 410-730-1036, hzane1@comcast.net www.GSMTS.com

MI, REDFORD: 23RD ANNUAL OLE TOY & TRAIN SHOW. St. Robert Bellarmine, Sunday, January 25, 2009, 11:00am-3:00pm. Open to public \$3.00 each/\$6.00 family. Hosted by SRB's Men's Club, Concessions, 150+ tables, live displays, testing, 8' tables \$12.00 prepaid or \$15.00 at door. Info: 313-937-1670, 313-937-1500 cbawalpc@yahoo.com

NC, ASHEVILLE: 19TH ANNUAL TRAIN SHOW. Back in civic center in downtown. February 20th: 12-7pm, February 21st: 9:45pm. 3 layouts and over 100 tables. Admission: \$5.00. More information: Fred Coleman 828-699-0983 E-mail: fred Coleman@bellsouth.net

NY, SYRACUSE: SYRACUSE MODEL RAILROAD CLUB'S 23RD ANNUAL OPEN HOUSE AND TRAIN MEET. Eastwood American Legion Post 1276, 102 Nichols Ave. February 22, 2009, 10:00am-4:00pm. Adults \$4.00, Children under 12 \$2.00, Family maximum \$12.00. Contact: Jim Beach 219 Caleb Ave., Syracuse, NY 13206, Phone 315-378-5780

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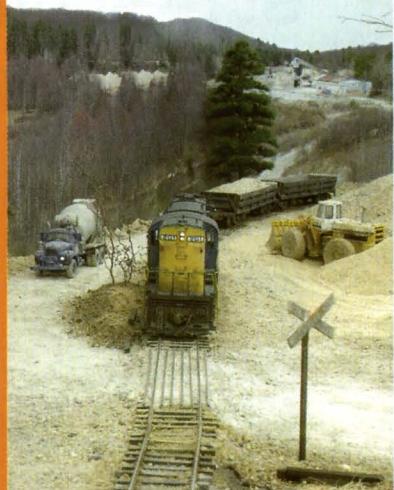
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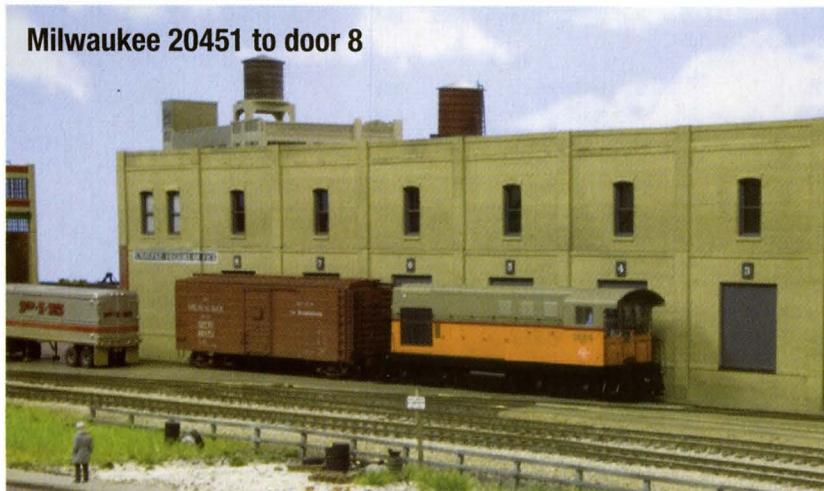
Model Railroader
MAGAZINE

The Operators

Andy Sperandeo

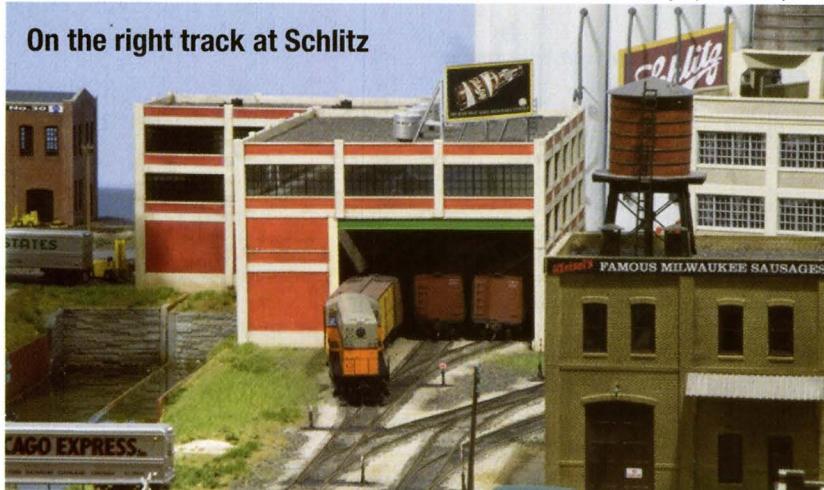
Sure spots for switching fun

Milwaukee 20451 to door 8



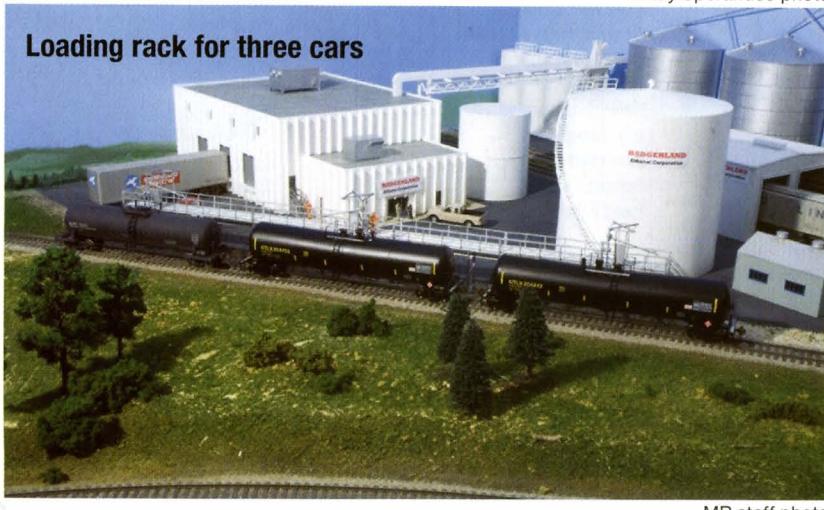
Andy Sperandeo photo

On the right track at Schlitz



Andy Sperandeo photo

Loading rack for three cars



MR staff photo

"Sure spot" is a term some railroads use for placing cars at specific track locations, not just anywhere near the customer's building. Shippers and receivers usually need cars placed precisely, as at numbered doors, for loading or unloading. For us this can add to the fun by requiring additional switching to line up and spot cars as specified on waybill cards or switch lists. Here on *Model Railroader*'s HO scale Beer Line layout, a Milwaukee Road boxcar is being delivered to door 8 at the freight house.

When industries have multiple tracks, each track usually serves a particular purpose and the customer wants certain cars placed on certain tracks. At the Schlitz warehouse on the Beer Line, the switch list orders cars to be placed on either track 1, 2, or 3 (from left to right). The switch crew usually sorts cars for like tracks together so that each track's cars can be spotted with one shove. Making the fewest possible movements inside the building is generally safest for both railroaders and warehouse workers.

At the ethanol plant on MR's Wisconsin & Southern layout, each tank car is uncoupled to be spotted at a filler point along the loading rack. Only three cars can be spotted at a time, and any extra empty cars will be left "off spot." That means leaving them on the plant lead off to the right, or on a nearby storage track, to be placed the next "day" (operating session) after the loaded cars are pulled. The left-most spot also serves for unloading the gasoline used to denature the ethanol. When, as in this photo, a gasoline car is spotted for unloading, only two ethanol cars can be loaded at a time.

N SCALE



DIESEL POWER FOR THE BROADWAY LIMITED

EMD E8A

Prototype Data:

Build Date: 1949-1956
Number Built: 449
Horsepower: 2250 hp

Model Data:

- Powerful Flywheel drive
- DCC Friendly
- Directional headlights
- Illuminated number boards

EMD NW2

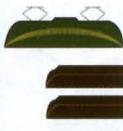
Prototype Data:

Build Date: 1939-1949
Number Built: 1143
Horsepower: 1000 hp

Model Data:

- Geared for low speed, high performance
- DCC Friendly
- Directional headlights
- Illuminated number boards

The scene - Chicago, Union Station. The year - 1950. The Pennsylvania Railroad's premier passenger train, the *Broadway Limited*, having just arrived from Harrisburg behind a pair of EMD E8 locomotives, is falling under the attention of two EMD NW2's that quickly go to work rearranging the cars. The BM70M will be detached from the consist and sent down the rails to the main Chicago Post Office. Meanwhile, the Santa Fe 4-4-2 Transcontinental Sleeper "Regal Spa", without its passengers ever disembarking, will be shunted off to Dearborn Station, the Chicago base of operations for the Santa Fe, where it will be attached to a waiting *Super Chief* (Item #106-6001, 6002, 6003) train and continue its journey westward. This process would repeat each day as the train would make its long journey.

 Between Harrisburg, PA, and New York, the *Broadway Limited* would be pulled by the electric GG1 locomotive (137-2001). On the non-electric portion of the journey between Harrisburg and Chicago, the journey would be finished up by a pair of EMD E8 diesel locomotives. The above consist matches the *Broadway Limited* as it ran in the 1950's.

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Read-Back is a self-contained feature that lets you see all CV settings within your decoder. We're adding it to all our new sound decoders. There's more terrific things happening...like adding a customizable Speed Table feature for those advanced railroaders who want to change the way their loco's respond as they transition from idle to high speed operation.

Wireless that is truly wireless

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